Altivar 58

变频器

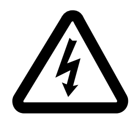
用户手册
编程手册
User's Manual
Programming Manual







Altivar 58



IT 中性点连接：在用于具有隔离系统或高阻抗系统 (IT) 且电压大于 480V ± 10% 的 3 相电网的情况下，必须断开接地的内部电磁兼容滤波电容器。详情请咨询施耐德电气产品技术支持人员，只有他们有资格执行此项操作。

ATTENTION

当变频器加电以后，电源部件与一些控制元件要连到电源上。*接触这些元件是特别危险的。变频器的盖必须保持关紧状态。*

在 ALTIVAR 断电以后，绿色 LED 熄灭，*在操作设备之前需等待 3 分钟*，这是电容器放电所需的时间。

当变频器保持通电时可通过禁止起动命令或速度给定值置零在操作期间使电机停车。如果出于人员安全考虑，需要禁止突然重新起动，电气锁定系统就不管用了：*此时需要在电源电路中安装一断路设备来切断电源。*

ATTENTION

变频器安装了安全设备，如果出现故障，就能够关闭变频器，随后使电机停车。电机本身可通过机械阻滞停车。最后，电压变化，特别是电源出现故障，也可以导致停车。

造成停车的故障排除后，电机有可能会自动重新起动，这会对某些机器和设备不利，特别是那些必须符合安全规程使用的设备。

在这种情况下，用户必须采取一定的预防措施以防止重新起动，特别是如果电机出现意外停车的情况下可通过使用低速检测器来切断变频器的电源。

设备的设计必须按照 IEC 标准的要求。

通常，在对设备的任何电气或机械元件进行操作之前须*断开变频器电源。*

本手册中描述的产品和设备既可从技术的观点出发，也可从操作方式出发在任何时候更换或改变，不可能如合同所述。

NOTE

目录



警告

只能将 Altivar 58 作为一个部件来看待，它并不是自行符合欧洲标准(机械标准和电磁兼容性标准)的机器或设备。最终用户有责任保证机器运行符合这些标准。

本变频器必须遵照国际和国内相关标准进行安装和调试。系统集成人员有责任按标准进行设备安装，他们必须遵守欧盟各国的 EMC 标准。

必须按本手册中的规范进行操作，以保证符合 EMC 标准的基本要求。

初步建议

交货

检查标签上的变频器规格是否与发货单及订单上的型号一致。

打开 Altivar 58 的包装，检查在运输过程中是否有损坏。

吊运和贮存

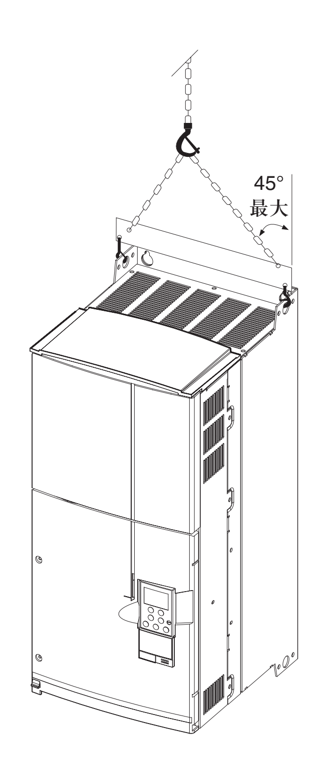
为了保护变频器，安装前的运输和贮存应带包装进行。

吊运至安装位置

Altivar 58 系列包括 7 种规格产品，其重量和尺寸各有不同。

小型变频器的包装拆除和安装可以不使用搬运设备。

大型变频器安装时必须使用吊钩。因此，为其专门配备了吊耳。起吊过程中必须遵守下图所示的注意事项：



带有散热器式及内置 EMC 滤波器的变频器的选择

电源					电机		Altivar 58				
电源电压 (1) U1…U2	进线电流 (2) U1	U2	最大预期线电流 Isc U1	U2	电机铭牌功率值 (3)		额定电流	最大瞬时电流 (4)	额定负载下的功耗 (5)	型号 (6)	重量

高力矩应用（170% Tn）

V	A	A	kA	kA	kW	HP	A	A	W		kg
200…240 50/60 Hz 单相	5.6	4.7	2	2	0.37	0.5	2.3	3.1	42	ATV-58HU09M2	2.2
	9.8	8.3	2	2	0.75	1	4.1	5.6	64	ATV-58HU18M2	2.2
	18.5	15.6	5	5	1.5	2	7.8	10.6	107	ATV-58HU29M2	3.8
	24.8	21.1	5	5	2.2	3	11	15	145	ATV-58HU41M2	3.8
	24.7	21.3	5	5	3	–	13.7	18.6	220	ATV-58HU72M2(7)	6.9
	35	30	22	22	4	5	18.2	24.7	235	ATV-58HU90M2(7)	13
	46	39.4	22	22	5.5	7.5	24.2	32.9	310	ATV-58HD12M2(7)	13
200…240 50/60 Hz 三相	9.7	8.3	5	5	1.5	2	7.8	10.6	107	ATV-58HU29M2	3.8
	13.4	11.4	5	5	2.2	3	11	15	145	ATV-58HU41M2	3.8
	17.2	15	5	5	3	–	13.7	18.6	170	ATV-58HU54M2	6.9
	22.4	19.5	5	5	4	5	18.2	24.7	220	ATV-58HU72M2	6.9
	34.7	30	22	22	5.5	7.5	24.2	32.9	235	ATV-58HU90M2	13
	44.4	38.2	22	22	7.5	10	31	42.2	310	ATV-58HD12M2	13
380…500 50/60 Hz 三相	3.4	2.6	5	5	0.75	1	2.3	3.1	55	ATV-58HU18N4	3.8
	6	4.5	5	5	1.5	2	4.1	5.6	65	ATV-58HU29N4	3.8
	7.8	6	5	5	2.2	3	5.8	7.9	105	ATV-58HU41N4	3.8
	10.2	7.8	5	5	3	–	7.8	10.6	145	ATV-58HU54N4	6.9
	13	10.1	5	5	4	5	10.5	14.3	180	ATV-58HU72N4	6.9
	17	13.2	5	5	5.5	7.5	13	17.7	220	ATV-58HU90N4	6.9
	26.5	21	22	22	7.5	10	17.6	24	230	ATV-58HD12N4	13
	35.4	28	22	22	11	15	24.2	32.9	340	ATV-58HD16N4	13
	44.7	35.6	22	22	15	20	33	44.9	410	ATV-58HD23N4	15
	43	35	22	65	18.5	25	41	55	670	ATV-58HD28N4	34
	51	41	22	65	22	30	48	66	780	ATV-58HD33N4	34
	68	55	22	65	30	40	66	90	940	ATV-58HD46N4	34
	82	66	22	65	37	50	79	108	940	ATV-58HD54N4	57
	101	82	22	65	45	60	94	127	1100	ATV-58HD64N4	57
	121	98	22	65	55	75	116	157	1475	ATV-58HD79N4	57

高力矩应用 (120% Tn)

V	A	A	kA	kA	kW	HP	A	A	W		kg
380…500 50/60 Hz 三相	51	41	22	65	22	30	44	55	750	ATV-58HD28N4	34
	67	53	22	65	30	40	60	66	925	ATV-58HD33N4	34
	82	66	22	65	37	50	72	90	1040	ATV-58HD46N4	34
	99	79	22	65	45	60	85	108	1045	ATV-58HD54N4	57
	121	97	22	65	55	75	105	127	1265	ATV-58HD64N4	57
	160	130	22	65	75	100	138	157	1730	ATV-58HD79N4	57

带有散热器式及内置 EMC 滤波器的变频器的选择

（1）额定电源电压：最低 U1，最高 U2。

（2）对于无额外扼流圈的 4 极电机为典型值，除了单相状态下的 ATV-58PU72M2,U90M2 与 D12M2 (7)。

（3）这些功率级别是对最大开关频率在 2-4 kHz 间而言的，由额定值决定，且为连续运行状态下参数。开关频率详情参见“技术特性”一节。

下列情况下 ATV-58 可工作在更高的开关频率下：

- 连续运行，额定值降低一级，例如：
ATV-58PU09M2 工作在 0.25 kW ，ATV-58PU18N4 工作在 0.37 kW，ATV-58PD12N4 工作在 5.5 kW。

- 如果功率额定值不降低，不要超过下面的运行条件：
每 60 s 周期内累计运行时间最长 36 s(负载系数 60 %)。

（4）60 s 以内。

（5）这些功率级别是连续工作时在最大允许开关频率下给出的(2 或 4 kHz，由额定值决定)。

（6）在参考类型 ATV-58P●●●M2 与 ATV-58P●●●N4 之下订购的变频器配备有一个显示模块。
在同样参考类型之下的以字母 Z (ATV-58P●●●Z) 结尾的变频器没有配备显示模块。
附加字母 Z 仅出现在包装上。



（7）
- 如果变频器连在单相电源上，就必须使用线路扼流圈（见附录中的选择表）。
- 对于工作在单相电源的三相变频器，“电源缺相”故障代码 IPL 必须设置为“NO”。如果在出厂设置中此故障代码设置为“YES”，出现“PHF”故障时变频器就会被锁定。

带有散热器式但无 EMC 滤波器的变频器的选择

电源					电机		Altivar 58				
电源电压 (1)	进线电流 (2)		最大预期线电流 Isc		电机铭牌功率值 (3)		额定电流	最大瞬时电流 (4)	额定负载下的功耗 (5)	型号 (6)	重量
U1…U2	U1	U2	U1	U2							

高力矩应用 (170% Tn)

V	A	A	kA	kA	kW	HP	A	A	W		kg
208…240 50/60 Hz 三相	43	40	10	22	11	15	47	64	745	ATV-58HD16M2X	34
	59	54	10	22	15	20	60	82	900	ATV-58HD23M2X	34
	71	64	10	22	18,5	25	75	102	895	ATV-58HD28M2X	57
	84	78	10	22	22	30	88	120	1030	ATV-58HD33M2X	57
	115	104	10	22	30	40	116	158	1315	ATV-58HD46M2X	57
380…500 50/60 Hz 三相	43	35	22	65	18,5	25	41	55	660	ATV-58HD28N4X	34
	51	41	22	65	22	30	48	66	775	ATV-58HD33N4X	34
	68	55	22	65	30	40	66	90	925	ATV-58HD46N4X	34
	82	66	22	65	37	50	79	108	930	ATV-58HD54N4X	57
	101	82	22	65	45	60	94	127	1085	ATV-58HD64N4X	57
	121	98	22	65	55	75	116	157	1455	ATV-58HD79N4X	57

高力矩应用 (120 % Tn)

V	A	A	kA	kA	kW	HP	A	A	W		kg
208…240 50/60 Hz 三相	58	52	10	22	15	20	60	64	890	ATV-58HD16M2X	34
	70	63	10	22	18,5	25	75	82	980	ATV-58HD23M2X	34
	82	74	10	22	22	30	88	102	975	ATV-58HD28M2X	57
	114	102	10	22	30	40	116	120	1215	ATV-58HD33M2X	57
	141	125	10	22	37	50	143	158	1610	ATV-58HD46M2X	57
380…500 50/60 Hz 三相	51	41	22	65	22	30	44	55	735	ATV-58HD28N4X	34
	67	53	22	65	30	40	60	66	915	ATV-58HD33N4X	34
	82	66	22	65	37	50	72	90	1020	ATV-58HD46N4X	34
	99	79	22	65	45	60	85	108	1030	ATV-58HD54N4X	57
	121	97	22	65	55	75	105	127	1245	ATV-58HD64N4X	57
	160	130	22	65	75	100	138	157	1700	ATV-58HD79N4X	57

带有散热器式但无 EMC 滤波器的变频器的选择

（1）额定电源电压：最低 U1，最高 U2。

（2）这些功率级别是对最大开关频率在 2-4kHz 间而言的，由额定值决定，且为连续运行状态下参数。开关频率详情参见“技术特性”一节。

下列情况下 ATV-58 可工作在更高的开关频率下：

- 对于过力矩连续运行，额定值降低一级，例如：
  ATV-58HD16M2X 工作在 7.5 kW，ATV-58HD28N4X 工作在 15 kW，ATV-58HD54N4X 工作在 30 kW
- 如果功率额定值不降低，不要超过下面的运行条件：
  每 60 s 周期内累计运行时间最长 36 s (负载系数 60 %)。

（3）60s 以内。

（4）这些功率级别是连续工作时最大允许开关频率下给出的(2 或 4 kHz，由额定值决定)。

（5）在参考类型 ATV-58P●●●M2 与 ATV-58P●●●N4 之下订购的变频器配备有一个显示模块。在同样参考类型之下的以字母 Z(ATV - 58HD●●M2XZ 与 ATV-58HD●●N4XZ)结尾的变频器没有配备显示模块。**附加字母 Z 仅出现在包装上。**

安装在基板式上并带有内置 EMC 滤波器的变频器的选择

电源					电机		Altivar 58				
电源电压 (1) U1…U2	进线电流 (2) U1	U2	最大预期线电流 Isc U1	U2	电机铭牌功率值 (3)		额定电流	最大瞬时电流 (4)	额定负载下的功耗 (5)	型号 (6)	重量

高力矩应用 (170% Tn)

V	A	A	kA	kW	HP	A	A	W		kg
200…240 50/60 Hz 单相	5.6	4.7	2	0.37	0.5	2.3	3.1	25	ATV-58PU09M2	1.8
	9.8	8.3	2	0.75	1	4.1	5.6	30	ATV-58PU18M2	1.8
	18.5	15.6	5	1.5	2	7.8	10.6	40	ATV-58PU29M2	2.9
	24.8	21.1	5	2.2	3	11	15	50	ATV-58PU41M2	2.9
	24.7	21.3	5	3	–	13.7	18.6	70	ATV-58PU72M2(7)	4.8
	35	30	22	4	5	18.2	24.7	75	ATV-58PU90M2(7)	11.5
	46	39.4	22	5.5	7.5	24.2	32.9	100	ATV-58PD12M2(7)	11.5
200…240 50/60 Hz 三相	9.7	8.3	5	1.5	2	7.8	10.6	40	ATV-58PU29M2	2.9
	13.4	11.4	5	2.2	3	11	15	50	ATV-58PU41M2	2.9
	17.2	15	5	3	–	13.7	18.6	60	ATV-58PU54M2	4.8
	22.4	19.5	5	4	5	18.2	24.7	70	ATV-58PU72M2	4.8
	34.7	30	22	5.5	7.5	24.2	32.9	75	ATV-58PU90M2	11.5
	44.4	38.2	22	7.5	10	31	42.2	100	ATV-58PD12M2	11.5
380…500 50/60 Hz 三相	3.4	2.6	5	0.75	1	2.3	3.1	35	ATV-58PU18N4	2.9
	6	4.5	5	1.5	2	4.1	5.6	40	ATV-58PU29N4	2.9
	7.8	6	5	2.2	3	5.8	7.9	50	ATV-58PU41N4	2.9
	10.2	7.8	5	3	–	7.8	10.6	55	ATV-58PU54N4	4.8
	13	10.1	5	4	5	10.5	14.3	65	ATV-58PU72N4	4.8
	17	13.2	5	5.5	7.5	13	17.7	80	ATV-58PU90N4	4.8
	26.5	21	22	7.5	10	17.6	24	90	ATV-58PD12N4	11.5
	35.4	28	22	11	15	24.2	32.9	110	ATV-58PD16N4	11.5
	44.7	35.6	22	15	20	33	44.9	140	ATV-58PD23N4	13.5

安装在基板式上并带有内置 EMC 滤波器的变频器的选择

（1）额定电源电压：最低 U1，最高 U2。

（2）对于无额外扼流圈的 4 极电机为典型值，除了单相状态下的 ATV-58PU72M2,U90M2 与 D12M2 (7)。

（3）这些功率级别是对最大开关频率在 2-4kHz 间而言的，由额定值决定，且为连续运行状态下参数。开关频率详情参见“技术特性”一节。

下列情况下 ATV-58 可工作在更高的开关频率下：

- 连续运行，额定值降低一级，例如：
  ATV-58PU09M2 工作在 0.25 kW ，ATV-58PU18N4 工作在 0.37 kW，ATV-58PD12N4 工作在 5.5 kW

- 如果功率额定值不降低，不要超过下面的运行条件：
  每 60 s 周期内累计运行时间最长 36 s（负载系数 60 %）。

（4）60 s 以内。

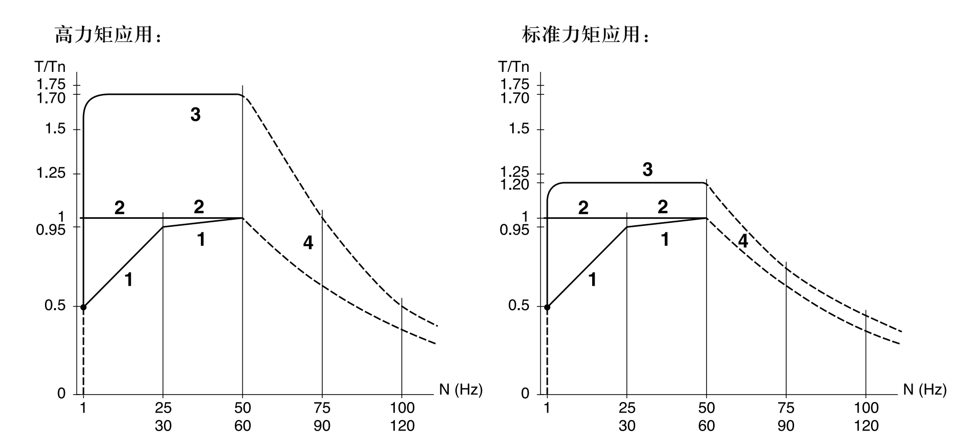
（5）此处所示的功率级别与内部耗散损失的比例有关，其他损失是通过别的散热设备或机架耗散掉的。
这些功率级别是连续工作时在最大允许开关频率下给出的（4 kHz）。

（6）在参考类型 ATV-58P●●●M2 与 ATV-58P●●●N4 之下订购的变频器配备有一个显示模块。
在同样参考类型之下的以字母 Z (ATV-58PiiiZ) 结尾的变频器没有配备显示模块。**附加字母 Z 仅出现在包装上**。

（7）如果变频器连接到单相电网上，则必须加进线电抗器(见附录中的选项表)。

有效力矩

力矩特性：



1 自冷却电机：连续有效力矩
2 强制冷却电机：连续有效力矩
3 瞬时过力矩最大持续时间为 60 秒
4 功率恒定时超速情况下的力矩

有效力矩：

- 高力矩应用：
200 % 额定电机力矩可持续 2 秒，170 % 额定电机力矩可持续 60 秒。

- 标准力矩应用：
140 % 额定电机力矩可持续 2 秒，120 % 额定电机力矩可持续 60 秒。

连续运行

对于自冷却电机，冷却能力与电机转速有关。因此，在电机速度小于额定速度一半时额定冷却能力就会降低。

超速运行

由于电压不再随频率变化，会出现力矩减小。与制造商一起检查电机是否可以超速运行。

注意：对特殊电机，其额定频率和最大频率可通过使用操作显示模块，可编程终端或 PC 软件在 40 至 500 Hz 之间进行调节。

技术特性

环境

防护等级	IP 21 和 IP 41 上部(符合 EN 50178 标准)
抗振动性	符合 IEC 68 - 2 - 6： • 峰值 1.5 mm，2~13 Hz • 1 gn，13~200 Hz。
抗冲击性	符合 IEC 68 - 2 - 27： • 15 g，11 ms
最高防污级	对于 ATV-58HD16M2X 至 D46M2X, ATV-58HD28N4 至 D79N4，ATV-58HD28N4X 至 D79N4X 变频器， •3 级，符合 UL508C 其他变频器： •2 级，符合 IEC 664-1 和 EN 50718。
最大相对湿度	93% 时无冷凝或滴水，符合 IEC 68 - 2 - 3
周围环境温度	贮存：- 25 °C ~ + 65 °C 运行： 对于变频器 ATV-58P 所有规格： • - 10 °C ~ + 40 °C 对于 ATV-58HU09M2 至 U72M2 与 ATV-58HU18N4 至 U90N4 变频器： • - 10°C ~ + 50 °C，额定值不降低 •最高可至 60 °C，超过 50 °C 后每升高 1 °C 电流额定值降低 2.2%。 对于 ATV-58HU09M2 至 D12M2 与 ATV-58HD12N4 至 D23N4 变频器： • - 10 °C ~ + 40 °C，额定值不降低 • 最高可至 50 °C，超过 40 °C 后每升高 1 °C 电流额定值降低 2.2 %。 对于 ATV-58HD16M2X 至 D46M2X，ATV-58HD28N4 至 D79N4 与 ATV-58HD28N4X 至 D79N4X 变频器： • - 10 °C ~ + 40 °C，额定值不降低 • 最高可至 +60 °C，超过 40 °C 后每升高 1 °C 电流额定值降低 2.2 %。
最大运行海拔高度	1000 m 不降容(超过此高度后，每升高 100 m 电流额定值降低 1 %)
安装方式	垂直

技术特性

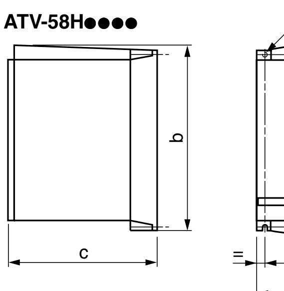
电气特性

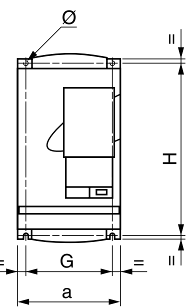
电源	电压 ATV-58●●●●M2 变频器 • 200 V - 10 % 至 240 V + 10 % 单项和三相
	ATV-58HD●●M2X 变频器：
	• 208 V - 10 % 至 240 V + 10 % 三相
	ATV-58●●●●N4 与 ATV-58●●●●N4X 变频器:
	• 380 V - 10 % 至 500 V + 10 % 三相
频率	50/60 Hz ± 5 %
输出电压	最高电压等于电源电压
电绝缘	功率和控制部分电绝缘(输入口、输出口、功率电源)
输出频率范围	0.1 ~ 500 Hz
开关频率	可配置： • 额定值不降低: 对于变频器 ATV-58●U09M2 至 D23M2X, ATV-58●U18N4 至 D46N4 与 ATV-58HD28N4X 至 D46N4X：0.5 - 1 - 2 - 4 kHz 对于变频器 ATV-58HD28M2X 至 D46M2X,ATV-58HD54N4 至 D79N4 与 ATV-58HD54N4X 至 D79N4X：0.5 - 1 - 2 kHz • 断续运行额定值不降低或额定值降低一级连续运行: 对于变频器 ATV-58●U09M2 至 D12M2 与 ATV-58●U18N4 至 D23N4：8 - 12 - 16 kHz 对变频器 ATV-58HD16M2X 至 D23M2X,ATV-58HD28N4 至 D46N4 与 ATV-58HD28N4X 至 D46N4X：8 - 12 kHz 对变频器 ATV-58HD28M2X 至 D46M2X,ATV-58HD54N4 至 D79N4 与 ATV-58HD54N4X 至 D79N4X：4 - 8 kHz
速度范围	1 ~ 100
制动力矩	不带制动电阻时为电机额定力矩的 30 %(典型值)。带制动电阻选件时可达 150 %。
瞬时过载力矩	2 秒内可达电机额定力矩的 200 %(对于标准力矩为 140 %)(典型值 ± 10 %) 60 秒内可达电机额定力矩的 170 %(对于标准力矩为 120 %)(典型值 ± 10 %)
变频器的保护和安全特性	- 短路保护： • 输出相之间 • 输出相与地之间 • 内部电源输出端 - 过热和过流保护 - 电源欠压和过压保护 - 电源缺相保护电路(避免三相变频器单相运行)
电机保护	- 集成在变频器内的热保护功能，不断地计算 I^2t 同时考虑转速。变频器断电后记忆电机热状态。 可根据电机冷却类型修改(使用显示模块、可编程终端或 PC 软件) - 电机断相保护 - 通过带选项卡的 PTC 传感器保护

外形尺寸—安装建议

外形尺寸

ATV-58H●●●●



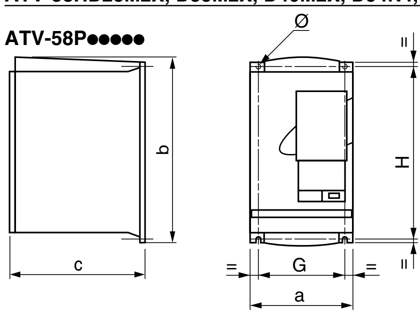


ATV-58H	a	b	c	G	H	Ø
U09M2, U18M2	113	206	167	96	190	5
U29M2, U41M2, U18N4, U29N4, U41N4	150	230	184	133	210	5
U54M2, U72M2, U54N4, U72N4, U90N4	175	286	184	155	270	5.5
U90M2, D12M2, D12N4, D16N4	230	325	210	200	310	5.5
D23N4	230	415	210	200	400	5.5
D16M2X, D23M2X, D28N4, D33N4, D46N4	240	550	283	205	530	7
D28N4X, D33N4X, D46N4X	240	550	283	205	530	7
D28M2X, D33M2X, D46M2X, D54N4, D64N4, D79N4	350	650	304	300	619	9
D54N4X, D64N4X, D79N4X	350	650	304	300	619	9

风扇通风流量

ATV-58HU09M2, U18M2, U18N4	自冷却
ATV-58HU29M2, U54M2, U29N4, U41N4, U54N4	36 m³/ 小时
ATV-58HU41M2	47 m³/ 小时
ATV-58HU72M2, U90M2, D12M2	72 m³/ 小时
ATV-58HU72N4, U90N4, D12N4, D16N4, D23N4	72 m³/ 小时
ATV-58HD16M2X, D23M2X, D28N4, D33N4, D46N4, D28N4X, D33N4X, D46N4X	292 m³/ 小时
ATV-58HD28M2X, D33M2X, D46M2X, D54N4, D64N4, D79N4, D54N4X, D64N4X, D79N4X	492 m³/ 小时

ATV-58P●●●●●



ATV-58P	a	b	c	G	H	Ø
U09M2, U18M2	113	206	132	96	190	5
U29M2, U41M2, U18N4, U29N4, U41N4	150	230	145	133	210	5
U54M2, U72M2, U54N4, U72N4, U90N4	175	286	151	155	270	5,5
U90M2, D12M2, D12N4, D16N4	230	325	159	200	310	5,5
D23N4	230	415	159	200	400	5,5

风扇通风流量：仅 ATV-58PU41M2 变频器有一个流量为 11 m³ / 小时的内部风扇。

推荐安装方式

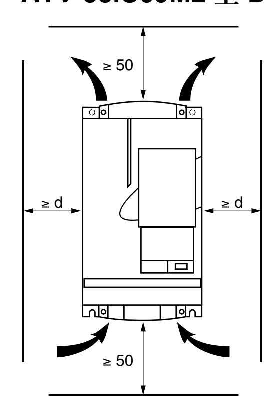
垂直安装，垂直度为 +/ - 10°。

不要紧靠散热部件放置。

保留足够的空间，以保证冷却空气可从变频器的底部到顶部循环。

安装及温度条件

ATV-58iU09M2 至 D12M2 与 U18N4 至 D23N4



前方自由空间：最小 10 mm。

ATV-58HU09M2 至 U72M2 与 ATV-58HU18N4 至 U90N4 :

- 温度 - 10 °C ~ 40 °C：d ⩾ 50mm：无特别要求。

  d = 0：从变频器顶部拆下防护盖，如下页图示(此时防护等级为 IP 20)。

- 温度 40 °C ~ 50 °C： d ⩾ 50 mm：从变频器顶部拆下防护盖，如下页图示(此时防护等级为 IP 20)。

  d = 0：加装控制通风组件 VW3A5882●(见 ATV-58 产品目录)。

- 温度 50 °C ~ 60 °C： d ⩾ 50 mm：加装控制通风组件 VW3A5882●(见 ATV-58 产品目录)。超过 50 °C，每升高 1 °C 降容 2.2 %。

ATV-58HU90M2 至 D12M2 与 ATV-58HD12N4 至 D23N4 :

- 温度 - 10 °C ~ 40 °C：d ⩾ 50 mm：无特别要求。

  d = 0：从变频器顶部拆下防护盖，如下页图示(此时防护等级为 IP 20)。

- 温度 40 °C ~ 50 °C： d ⩾ 50 mm：从变频器顶部拆下防护盖，如下页图示(此时防护等级为 IP 20)。超过 40°C，每升高 1 °C 降容 2.2 %。

  d = 0：加装控制通风组件 VW3A5882●(见 ATV-58 产品目录)。超过 40 °C，每升高 1 °C 降容 2.2 %。

ATV-58P●●●●

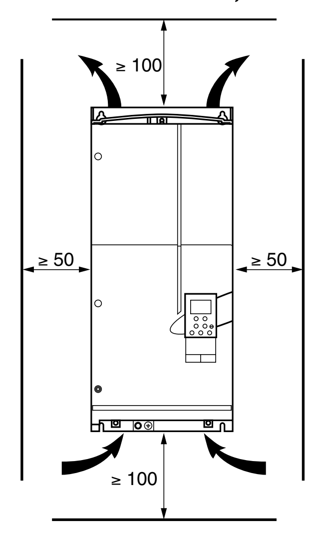
- 外壳安装：

  - 外部温度(VW3A5882● 的最冷表面): - 10 °C ~ + 40 °C
  - 外壳内温度：与 ATV-58H●●●● 的限制与安装条件以及额定值降低情况相同。

- 机架安装：

  - 环境温度：-10 °C ~ + 40 °C。

ATV-58HD16M2X, D46M2X, D28N4 至 D79N4 和 D28N4X 至 D79N4X



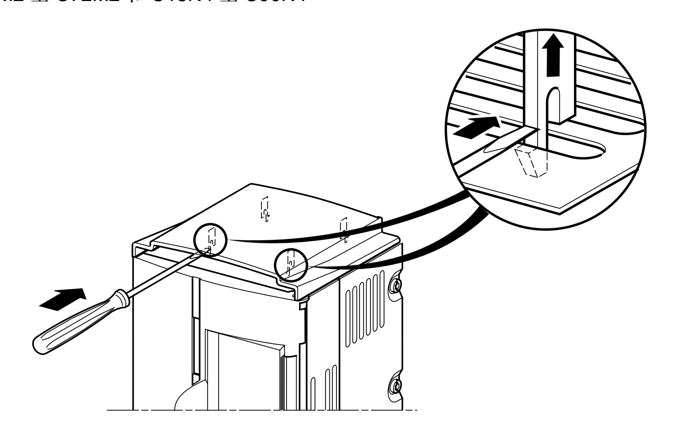
前方自由空间：最小 50 mm。

• 温度 - 10 °C ~ 40 °C ：无特别要求。

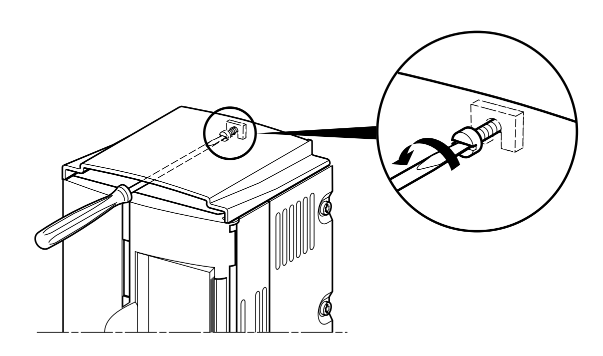
• 温度 50 °C ~ 60 °C ：加装控制通风组件 VW3A588●●●(见 ATV-58 产品目录)。
超过 40 °C ，每升高 1 °C 降容 2.2 %。

IP 41 防护盖的拆卸

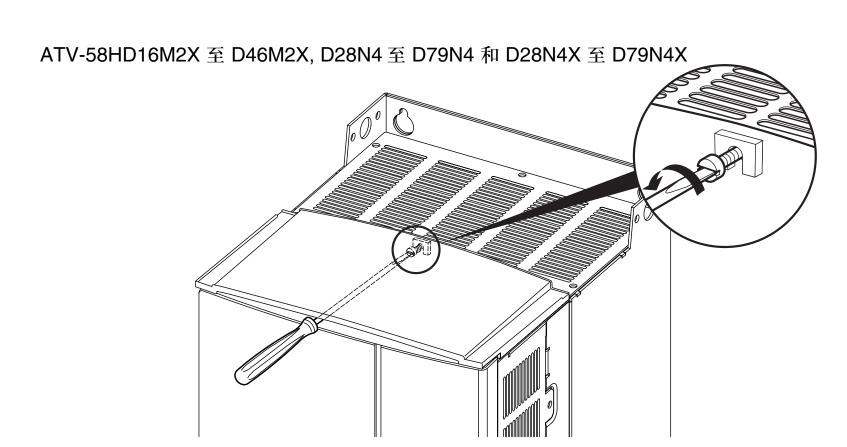
ATV-58●U09M2 至 U72M2 和 U18N4 至 U90N4



ATV-58●U90M2, D12M2 和 D12N4 至 D23N4



ATV-58HD16M2X 至 D46M2X, D28N4 至 D79N4 和 D28N4X 至 D79N4X

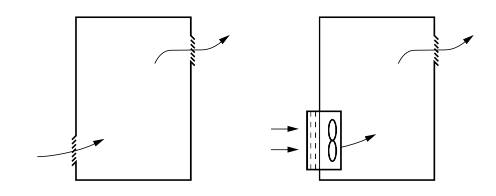


壁挂式或落地式安装的封装

查看前页上的安装建议。

为确保在变频器内正常的空气循环，需要：

- 安装通风格栅
- 如果装了过滤器却没安装强迫通风装置，应确保足够的通风。
- 使用专用的 IP 54 过滤器



防尘、防潮的金属封装外壳（防护等级 IP 54）

在下面的环境条件下，变频器需要安装在防尘、防潮的金属封装中：
有灰尘、腐蚀性气体，湿度大、有凝结或滴水的可能，喷溅的液体等。

为避免热量在变频器内聚积，应当增加一个风机以使壳体内的空气循环起来，参见 VW3A5882 •（见 ATV-58 产品目录）。

这就意味着变频器可安装于内部最高温度为 60 °C 的封装中。

封装尺寸的计算

最大热阻 Rth (°C /W) ：

$$Rth = \frac{\theta° - \theta°e}{P}$$

θ° = 箱体内最高温度，以 °C 为单位
θ°e = 外部最高温度，以 °C 为单位
P = 耗散在箱体内的总功率，以 W 为单位

变频器的耗散功率：见“变频器的选择”一节。
另外还要加上其他设备元件的耗散功率。

封装上有用的散热面积 S (m^2) ：
（对于壁挂式 S (m^2) = 两侧 + 顶盖 + 前面板）

$$S = \frac{K}{Rth}$$

K = 箱体每平方米的热阻值

对于金属外壳： K = 0.12 带内部风机
K = 0.15 不带风机

注意：不要采用绝缘封装外壳，因为其热传导性太差。

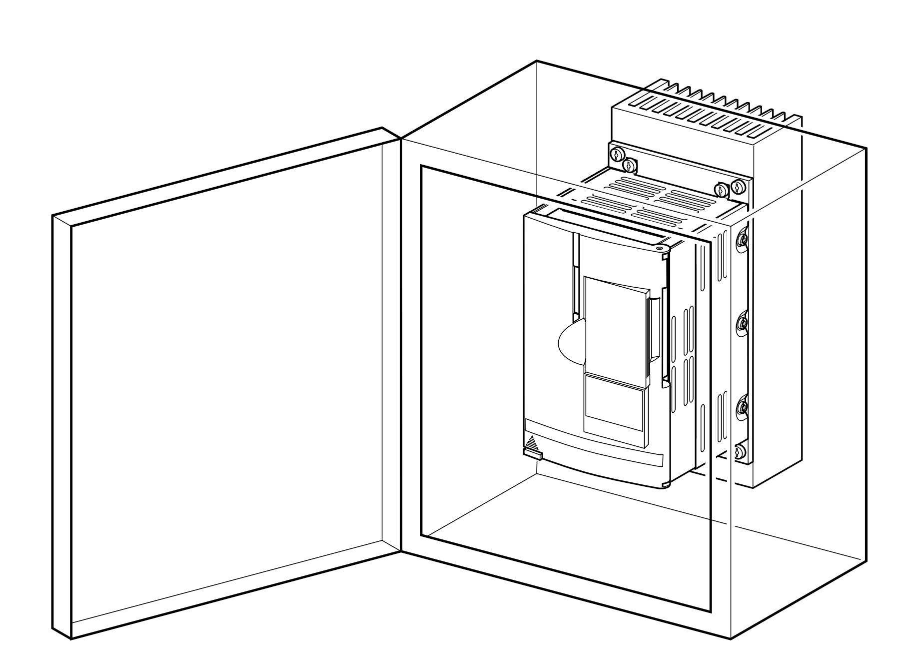
采用基板式变频器在封装外壳内的耗散功率会减小，因此更容易达到 IP 54 的防护等级。
从 208 - 240 V 时的 11 kW 与 380 - 500 V 时的 18.5 kW，IP 54 组件可通过通风装置将箱体内耗散的热量散至外界（见 ATV-58 产品目录）。

壁挂式或落地式安装的封装 — 基板式变频器

• 对于防尘防潮安装应使用 VW3 - A5880● 组件（见 ATV-58 产品目录），并查看设备提供的安装说明。记住要在金属板的每一侧各安装一个热衬板以形成保护壳，一个热衬板用于变频器，另一个用于 VW3 - A5880●。

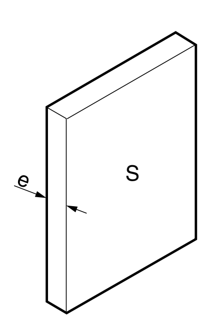
• 用于安装变频器的金属板或箱体必须具有如下特性：
- 厚度：1.5 至 3 mm
- 金属板：不锈钢或涂漆钢板，要足够光滑
- 环氧树脂烤漆（不要用涂漆), 最大厚度为 70 优质或中等质地。

• 按照“设置”一章中的说明，检查变频器的温升状况，确保安装正确。



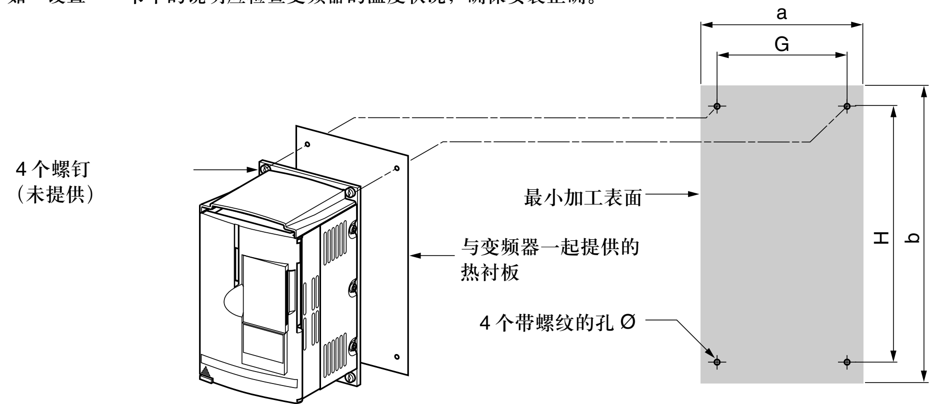
基板式变频器在机械框架上的安装

下面这些型号的变频器，可以安装在铸铁或铝机械框架上，安装时应遵守下列条件：
- 最高环境温度：40 °C
- 加工后的机架配合表面要求光洁度最大为 100um，粗糙度最大为 3.2 。
- 变频器必须安装在具有最小厚度“**e**”和暴露在外部的最小矩形冷却表面“**S**”的支架（机架）。



参考 变频器	最小表面 **S** m^2	最小厚度 **e** mm	
		铸铁	铝
ATV-58PU09M2 ATV-58PU18M2	0.25	20	10
ATV-58PU29M2 ATV-58PU41M2 ATV-58PU18N4 ATV-58PU29N4 ATV-58PU41N4	1		20

如“设置”一节中的说明应检查变频器的温度状况，确保安装正确。

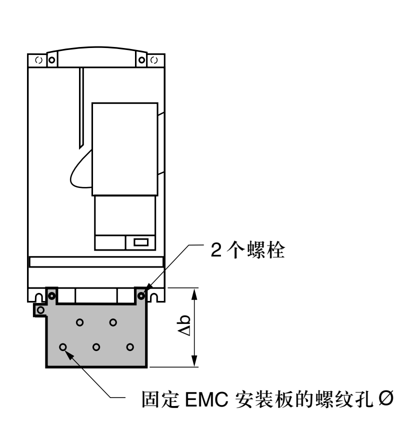


轻轻锉一下套了扣的孔，清理掉毛刺。

变频器 型号	a mm	b mm	G mm	H mm	Ø mm
ATV-58PU09M2 ATV-58PU18M2	120	220	96	190	M4
ATV-58PU29M2 ATV-58PU41M2 ATV-58PU18N4 ATV-58PU29N4 ATV-58PU41N4	160	240	133	210	M5

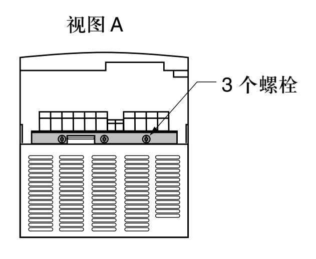
电磁兼容性 — 安装

变频器附带有 EMC 安装板。
按照下图所示，用附带的螺栓将 EMC 等电位安装板固定在 ATV-58F 的散热器螺纹孔上。

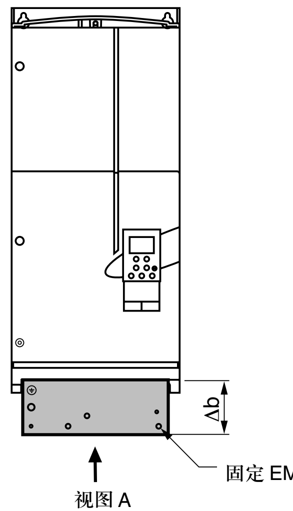


	Δb	Ø
ATV58●U09M2, U18M2,	63	4
ATV58●U29M2, U41M2, U18N4, U29N4, U41N4	64.5	4
ATV58●U54M2, U72M2, U54N4, U72N4, U90N4	64.5	4
ATV58●U90M2, D12M2, D12N4, D18N4,	76	4
ATV58●D23N4	76	4

视图 A



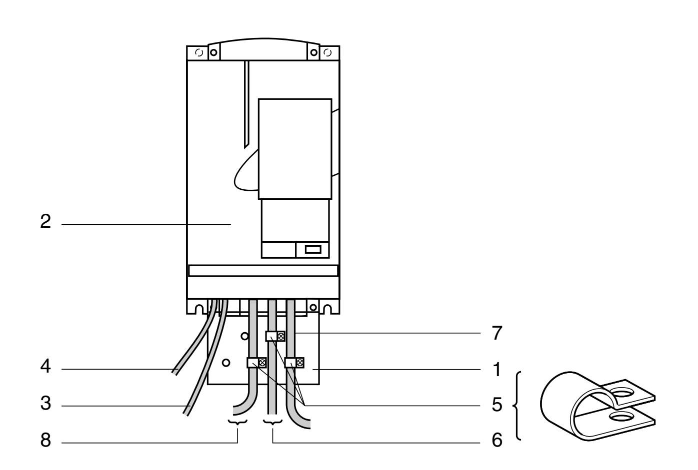
	Δb	Ø
ATV58HD16M2X, D23M2X, D28N4, D33N4, D46N4 D28N4X, D33N4X, D46N4X	80	5
ATV58HD28M2X, D33M2X, D46M2X, D54N4, D64N4, D79N4 D54N4X, D64N4X, D79N4X	110	5



电磁兼容性 — 接线

安装图原理

- 变频器、电机和屏蔽电缆之间的接地端必须是“高频”等电位的。
- 电机、制动电阻（如果有）和控制线电缆都应使用屏蔽电缆，且电缆两端的屏蔽层均为 360° 接地。如果电缆管或金属管没有破损，则可以在部分长度上充当屏蔽层使用。
- 确保电源电缆（主电源）和电机电缆之间留有最大隔离。



1 - 随变频器一同提供的接地用金属板，安装如图所示。
2 - Altivar 58
3 - 非屏蔽的电源线或电缆。
4 - 非屏蔽电缆，用于故障继电器触点输出的连线。
5 - 屏蔽电缆 6、7、8 和 9 应尽量靠近变频器固定和接地：
- 剥去导线绝缘皮
- 使用适当大小的夹线板将剥出的屏蔽线固定在安装板 1 上。屏蔽层必须紧压在金属板上以保证接触良好。
- 压线片材料：不锈钢。

6 - 接电机的屏蔽电缆两端都要接地。
该屏蔽电缆不能被切断，中间的端子必须装在 EMC 屏蔽的金属盒中。
7 - 连接控制 / 指令系统的屏蔽电缆。
如果需要使用几根导线，则要求使用最小截面积为 0.5 mm^2 的导线。
屏蔽层必须两端接地，不能切断，并且中间端子都必须装在 EMC 屏蔽的金属盒中。
8 - 连接制动电阻（如果有）的屏蔽电缆。屏蔽层必须两端接地，不能切断，中间端子必须装在 EMC 屏蔽的金属盒中。

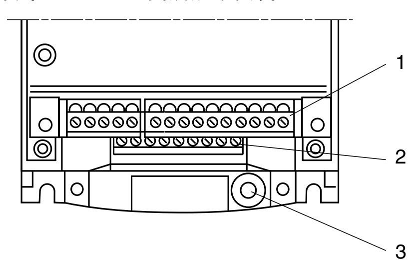
注意：
・如果使用附加的进线滤波器，则它应安装在变频器下面（ATV-58H）或侧面（ATV-58P），使用非屏蔽电缆与电源直接相连。变频器上的接口 3 与滤波器输出电缆相连。
・变频器、电机以及电缆屏蔽层间 HF 高频等电位连接，但仍需要将保护导线 PE（黄绿色）与每一组件上合适的端子相连。

外引端子 — 功率端子

外引端子

要连接外引端子时，必须断掉变频器的电源，开锁并打开端子的铰链盖。

端子位置：Altivar 变频器的下部。



1 - 控制端子
2 - 功率端子
3 - 连接保护导线的端子，要用符合 EN50178（接地漏电流）标准的截面为 10 mm² 的导线接地。

功率端子

端子规格

Altivar ATV-58●	端子	最大连接能力 能力 AWG	mm²	拧紧 力矩 Nm
U09M2, U18M2	所有 端子	AWG 14	1.5	0.5
U29M2, U41M2, U18N4 U29N4, U41N4	所有 端子	AWG 8	6	0,75
U54M2, U72M2, U54N4 U72N4, U90N4	所有 端子	AWG 8	6	0,75
U90M2, D12M2, D12N4 D16N4, D23N4	所有 端子	AWG 6	10	2

Altivar ATV-58H	端子	最大连接能力 能力 AWG	mm²	拧紧 力矩 Nm
D28N4, D28N4X,	PA PB	AWG 6	10	2
	其他 端子	AWG 4	16	3
D16M2X, D23M2X, D33N4, D46N4 D33N4X, D46N4X	PA PB	AWG 4	16	3
	其他 端子	AWG 2	35	4
D28M2X, D33M2X, D46M2X, D54N4, D64N4, D79N4 D54N4X, D64N4X, D79N4X	PA PB	AWG 2	35	4
	其他 端子	AWG 2/0	70	10

功率端子

端子的排列

⏚	L1	L2	+	-	U	V	W	⏚

ATV-58●U09M2 和 U18M2



ATV-58●U29M2 至 D12M2
和 ATV-58●U18N4 至 D23N4

⏚	L1	L2	L3	+	-	PA	PB	U	V	W	⏚

ATV-58HD16M2X 至 D46M2X,
ATV-58HD28N4 至 D79N4
和 ATV-58HD28N4X 至 D79N4X

端子功能

端子	功能	适用于 Altivar ATV-58●
⏚	Altivar 接地端子	所有型号
L1 L2	电源	所有型号
L3		除 U09M2 与 U18M2 之外的
+ -	直流母线输出	U09M2 和 U18M2 D16M2X 至 D46M2X D28N4 至 D79N4 D28N4X 至 D79N4X
PA PB	输出至 制动电阻	除 U09M2 与 U18M2 之外的
U V W	输出至电机	所有型号
⏚	Altivar 接地端子	所有型号

与直流母线（DC bus）相连：连接外部直流电源

对于 ATV58●U09M2 与 U18M2，直接把外部支流电源连接到变频器的 + 与 - 端子上。

对于 ATV58iU29M2 至 D12M2 与 ATViU18N4 至 D23N4，电源正极 (+) 接在 PA 端子上，负极 (-) 接在紧挨功率端子的 J16 标记端子上。

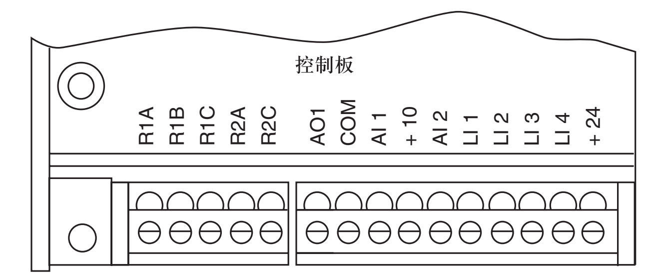
对于 ATV58HD16M2X 至 D46M2X，ATV58HD28N4 至 D79N4 与 ATV58HD28N4X 至 D79N4X，外部直流电源连在变频器的 +、- 端子上，但为了给电容器预充电，需要在外部加装带电阻的设备。

控制端子

端子特性

- 用于屏蔽的连接端子：用于金属接头或线夹。
- 2 个可拆卸端子，一个是继电器接点，另一个是低压 I/O 口：
- 最大接线能力：1.5 mm² – AWG 14
- 最大紧固力矩：0.4 Nm

端子的排列



端子功能

端子	功能	电气特性
R1A R1B R1C	故障继电器 R1 的公共端 (R1C) 上的 C/O 接点	最小通断能力： - 直流 24V 时为 10mA⎓ 电感性负载条件下的最大通断能力 (cos φ 0.4 and L/R 7 ms) : - 交流 250V 时和直流 30V 时为 1.5A⎓
R2A R2C	R2 可编程继电器的 N/O 接点	
AO1	电流模拟输出	模拟输出 X — Y mA。 X 与 Y 可编程设定。 出厂设置为 4 - 20mA，阻抗为 500Ω
COM	逻辑和模拟输入的公共端	
AI1	电压模拟输入	模拟输入 0 — 10V 阻抗 30 kΩ
+10	为设定点 1 - 10kΩ 的电位计供电	电压 +10V（ - 0 + 10 %），电流最大 10 mA，防短路和过载
AI2	电流模拟输入	模拟输出 X — Y mA。 X与Y可编程设定。 出厂设置为 4 - 20 mA，阻抗为 100 Ω
LI1 LI2 LI3 LI4	可编程逻辑输入	可编程逻辑输入 阻抗 3.5kΩ 电源电压 +24V（最大30V） <5 V 为 0 态，>11 V 为 1 态
+ 24	输入口电源	电压 +24 V，抗短路和过载， 最低 18 V，最高30 V 最大通过电流 200 mA

接线图

单相电源

（1）如果需要，可加进线电抗器。
（2）故障继电器触点，用于远程指示变频器状态信号。
（3）内部 +24 V 端子。如果使用一个 +24 V 外部电源，把 0 V 连接到COM端子，不要使用变频器的+ 24 V 端子，把 LI 输入公用端子连接到外部电源的 + 24 V。
（4）R2 可再分配继电器。
（5）A2 制动模块 VW3 A58701，仅对于使用制动电阻的 U09M2 与 U18M2 型变频器。

注意：在变频器附近或与相同电路相连的所有电感电路中，均须安装干扰抑制器，如继电器、接触器、电磁阀、荧光灯等。

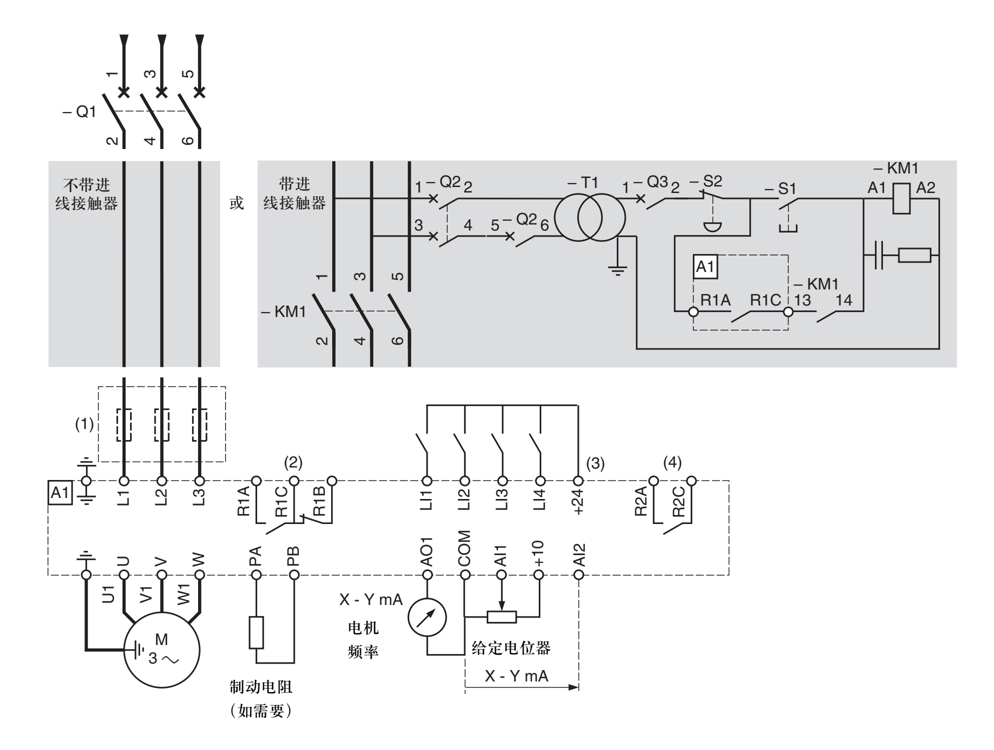


对于工作在单相电源的三相变频器，“电源缺相”故障代码 IPL 必须设置为“NO”。如果在出厂设置中此故障代码设置为“YES”，出现“PHF”故障时变频器就会被锁定。

可与 Altivar 变频器一起使用的组件：见产品目录。

接线图

3 相电源



（1）如果需要，可加进线电抗器（对于 ATV58●U29M2 至 D12M2 与 U18N4 至 D23N4 型变频器）。
（2）故障继电器触点，用于远程指示变频器状态信号。
（3）内部 +24 V 端子。如果使用一个 + 24 V 外部电源，把 0 V 连接到 COM 端子，不要使用变频器的 + 24 V 端子，把 LI 输入公用端子连接到外部电源的 + 24 V。
（4）R2 可再分配继电器。

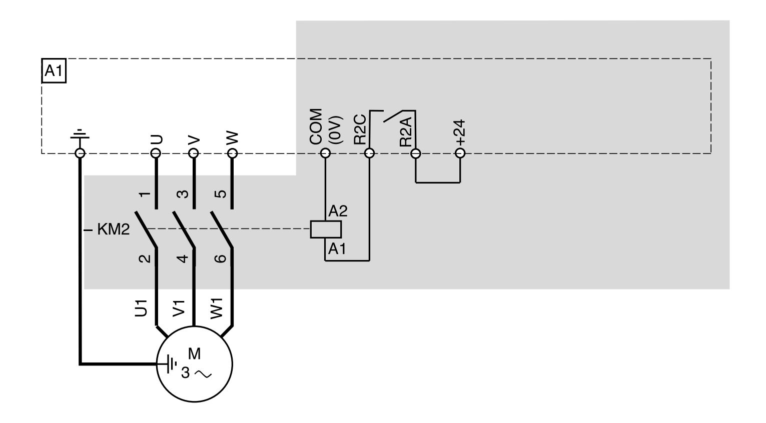
注意：在变频器附近或与相同电路相连的所有电感电路中，均须安装干扰抑制器，如继电器、接触器、电磁阀、荧光灯等。

可与 Altivar 变频器一起使用的组件：见产品目录。

接线图

带有输出接触器的接线图，用于 ATV58●U29M2 至 D12M2 与 U18N4 至 D23N4 型变频器。

阴影部分可以是多种类型的电路图（单相、三相等）。



使用继电器 R2 或带有 I/O 扩展卡的逻辑输出口 LO（直流 24V）来实现“输出接触器控制”功能。
参见编程手册。

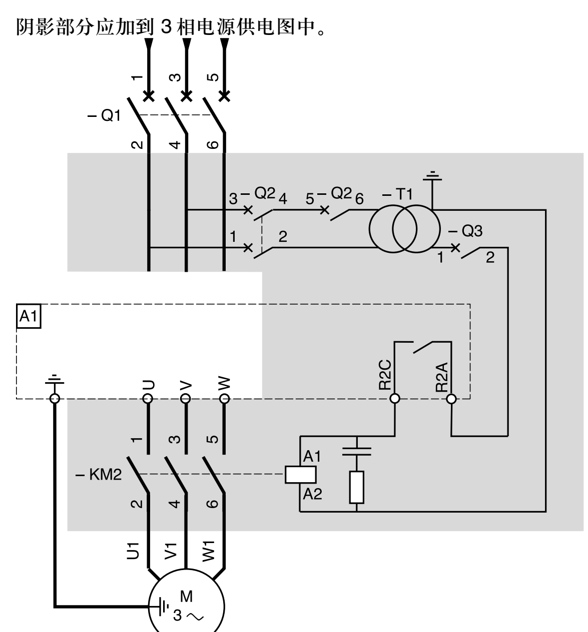
注意：在变频器附近或与相同电路相连的所有电感电路中，均须安装干扰抑制器，如继电器、接触器、电磁阀、荧光灯等。

可与 Altivar 变频器一起使用的组件：见产品目录。

接线图

带有输出接触器的接线图，用于 ATV58HD16M2X 至 D46M2X，D28N4 至 D79N4 与 D28N4X 至 D79N4X 型变频器。

阴影部分应加到 3 相电源供电图中。

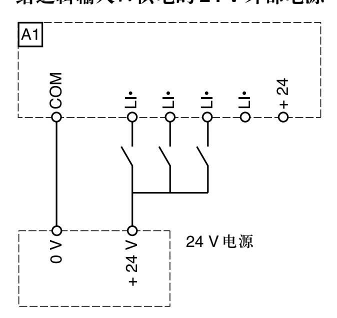


使用继电器 R2 或逻辑输出口 LO（使用 I/O 扩展卡来对线圈开关）（直流 24 V）来实现“输出接触器控制”功能。
参见编程手册。

注意：在变频器附近或与相同电路相连的所有电感电路中，均须安装干扰抑制器，如继电器、接触器、电磁阀、荧光灯等。

可与 Altivar 变频器一起使用的组件：见产品目录。

给逻辑输入口供电的 24 V 外部电源



接线和使用注意事项

功率

遵守标准中推荐的横截面积选择电缆。

变频器必须接地，以便符合相关的漏电流（大于 3.5 mA）规则。考虑到由漏电流可以产生直流分量，在进线保护中不要使用会有残余电流的设备。如果在同一电网上安装了几台变频器，每台变频器必须分别接地。如有必要，安装线路扼流圈（参考产品目录）。

在安装过程中，功率电缆要与弱电信号电缆（探测器、PLC、测量仪器、视频线、电话线）分开布置。

控制

控制电缆和功率电缆要分开。对于控制和速度给定回路，建议使用双绞屏蔽线，各线之间间距 25 - 50 mm，屏蔽层两端接地。

使用注意事项

在功率控制模式下使用**线接触器**：



- **不要频繁切换接触器 KM1**（否则会使滤波电容过早老化），**且要使用 LI1 - LI4 输入口控制变频器，**
- **如果周期时间超过 60 秒，绝对有必要测量这些值。**

如果安全标准要求隔离电机，应在变频器输出端连接接触器，并使用“输出接触器控制”功能（参见编程手册）。

故障继电器，解锁

变频器加电且无故障时，故障继电器通电。它在公共端有一个 C/O 触点。

出现下列故障信号时，变频器解除锁定：

- 变频器断电，直到显示屏和指示灯熄灭，然后重新上电。
- 通过逻辑输入口自动或远程解锁：参见编程手册。

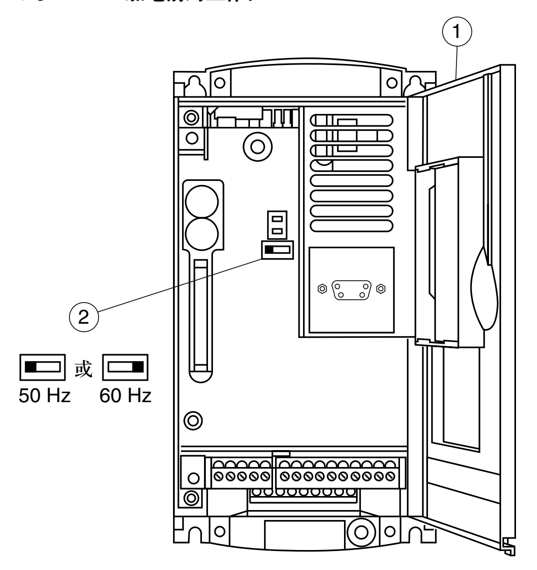
可编程 I/O 口及其功能：

参见编程手册。

设置

Altivar 出厂设置可满足大多数运行条件的要求。

☞ **Altivar 加电前的工作：**



打开变频器的前盖 ①，可看到控制板上的 50/60Hz 的转换开关 ②。
安装了选项板时，该转换开关仍然可用。
根据电机型号，选择 50 或 60 Hz。

预置工作点：

50 Hz 位置（出厂设置）：
- 230 V 50 Hz（对于 ATV58●●●●M2 与 M2 变频器）
- 400 V 50 Hz（对于 ATV58●●●●N4 与 N4 变频器）

60 Hz 位置：
- 460V 60Hz

下面几个工具可协助完成设置工作：
- 显示模块　　参见：VW3 A58101（变频器是否附带此显示模块由订单类型决定）。
- PowerSuite 解决方案：　（见目录）。

对于 Altivar 的设置与维护的详细信息，可参考各工具附带的文件。

如果 Altivar 配备了 I/O 扩展卡或通信卡，请参考随卡附带的文件。

IT 中性点连接提示：在用于具有隔离系统或高阻抗系统 (IT) 且电压大于 480 V ± 10 % 的 3 相电网的情况下，除了变频器 ATV-58HD28N4 至 HD79N4 与 ATV-58H●●●●X 外，其他变频器接地的内部电磁兼容滤波电容器必须断开。详情请咨询施耐德电气产品技术支持人员，只有他们有资格执行此项操作。

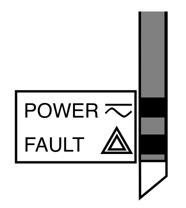
检查变频器的热状态

必须检查 ATV-58P●●●● 基板式上变频器的安装，特别是在机架上安装时。
按下列步骤进行：- 让变频器在最重负载和最高环境温度条件下运行。
- 使用显示模块、可编程终端或 PC 软件观察，直至下列参数稳定为止：
DriveThermal. tHd（菜单 1 - SUPERVISION 监视）

该参数不能超过 100 %。
如果超过，应检查安装情况、使用条件及变频器型号是否合适。

运行

Altivar 前面板上的信号指示：



绿色LED 电源  亮：变频器上电

红色LED 故障 △
- 亮：变频器故障
- 闪烁：变频器锁定，不能使用显示模块上的“STOP”（停止）按钮或改变配置。直至“forward（正转）”、“reverse（反转）”和“shutdown via injection（直流注入制动）”等命令被复位后，电机才能重新起动。

显示模块屏幕上的显示模式

显示预置的频率设定点或变频器故障

可通过显示模块对显示模式进行修改：参见编程手册。

维护

对设备进行操作之前，**关闭电源，查看绿色 LED 是否已熄灭，等待电容器放电结束**（约 3 分钟）。



在不同的电源电压下，+、- 端子或 PA 和 PB 端子的电压可能会达到 850V。

如果在设置或运行过程中出现问题，应首先确认环境、安装和连线是否与建议相符。

维护

Altivar 58 不需要任何预防性维护。但我们仍然建议您定期作下列工作：

- 检查环境条件和连线紧固程度
- 保证变频器周围环境温度保持在允许范围内，通风良好（风扇平均运行寿命：3 - 5 年，取决于运行状态）
- 必要时对变频器进行除尘。

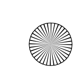
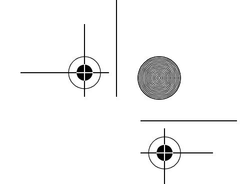
维护帮助

如果电源一直保持供电，则最先检测到的故障将被记录下来并显示在屏幕上：变频器锁定，红色 LED 亮，故障继电器 R1 激活。

参见编程手册。

备件和修理

关于 Altivar 58 变频器的备件及修理问题，请向施耐德电气产品支持人员咨询。

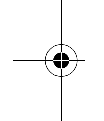



警 告

本文件涉及 Altivar 58 变频器的使用，特别适用于以下选件：

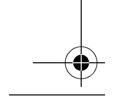
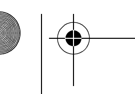
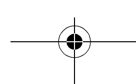
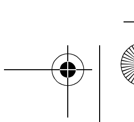
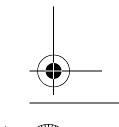
- VW3A58101 显示模块
- VW3A58201 或 VW3A58202 I/O 扩展板，如果可用。

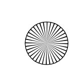
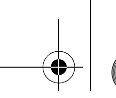
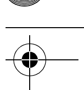
变频器的操作的方法、菜单和类型也可以由其他选件修改，请参考该选件的相关文件。



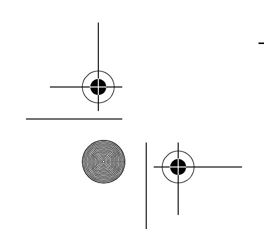

自从首次商品化， Altivar 58 就包括了一些附加功能。本文档适用于较早的设备，但文中所描述的参数在那些变频器中可能缺失。

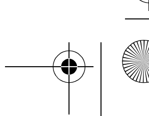
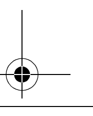
有关安装、连接、启动和维护说明，请参见 Altivar 58 变频器和 I/O 扩展板的用户手册。

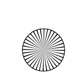






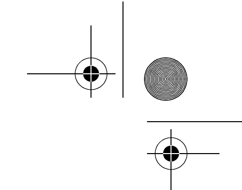





目录





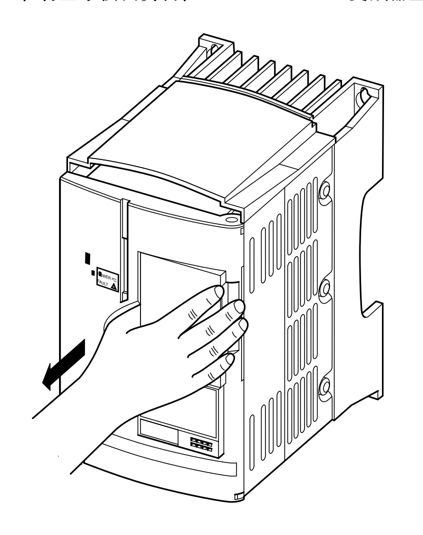
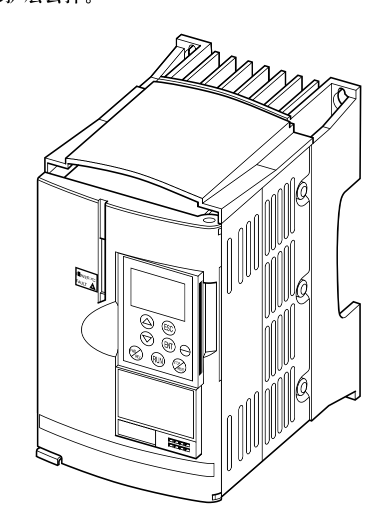
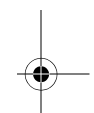


简介

VW3A58101 显示模块与 ATV58 ••••M2 和 ATV58 ••••N4 变频器一起供货。
ATV58 ••••••Z 变频器没有配供显示模块。它需要单独订购。

在变频器上安装显示模块：

在将显示模块安装在 ATV58 ••••••Z 变频器上之前应将保护层去掉。

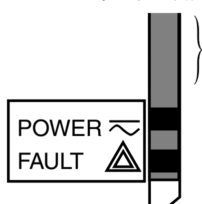




显示模块必须在断电情况下进行连接和断开连接。如果在通过显示模块对变频器的控制有效时显示模块却断开，则变频器将锁定在故障模式 SLF。

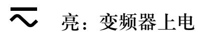
远程安装显示模块：

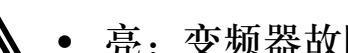
使用型号为 VW3A58103 的套件，其中包括 1 条带有连接器的电缆，在机箱门上安装所需的零件以及安装指导。

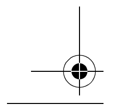
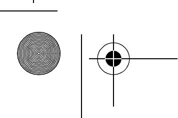
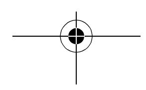
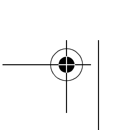
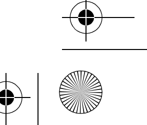
Altivar 前面板的信号指示

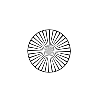
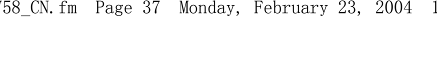
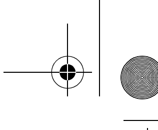
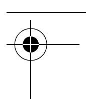


其它 LED，显示通信选项板的状态。

绿 LED，电源  亮：变频器上电

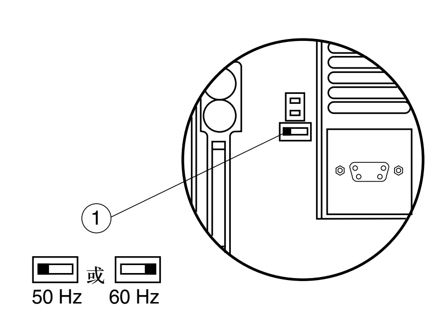
红 LED，故障 
- 亮：变频器故障
- 闪烁：按下显示模块上的 STOP 键或改变配置后变频器就被锁定一次，直到先前的 “forward”（正转）、“reverse”（反转）和 “injection stop”（停止）命令被复位后，电机才能得到驱动。

简介

☞在给 Altivar 变频器上电与使用显示模块之前：



打开变频器的前盖可以看到控制板上的 50/60 Hz 选择开关 (1) 。如果有选件卡，则通过它可以使用选择开关。根据选用电机的频率，将开关位置置于 50 或 60Hz。

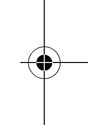
预置工作点：

50 Hz 位置 （出厂设置）：
- 230 V 50 Hz 用于 ATV58 •••• M2
- 400 V 50 Hz 用于 ATV58 •••• N4

60 Hz 位置：
- 230 V 60 Hz 用于 ATV58 •••• M2
- 460 V 60 Hz 用于 ATV58 •••• N4

显示模块可用于：

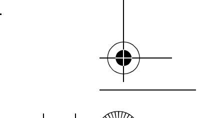
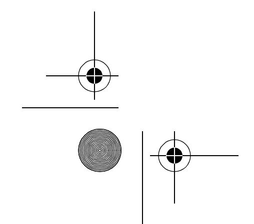
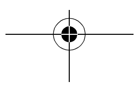
- 变频器识别号、电气值、运行或故障参数
- 修改变频器的设置和配置
- 通过操作键盘实现本地控制
- 在显示模块的固定存储器中保存或恢复配置信息

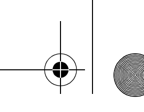
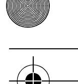
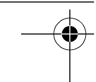


☞返回出厂设定：

- 切断变频器电源。
- 解锁并打开 Altivar 盖以便使用控制卡上的 50/60 Hz 开关 (1) 。如果有选件卡，则通过它可以使用选择开关。
- 改变控制卡上 50/60 Hz 开关 (1) 的位置。
- 接通变频器电源。
- 切断变频器电源。
- 将控制卡上的 50/60 Hz 开关 (1) 复位为它的初始位置 （电机额定频率）

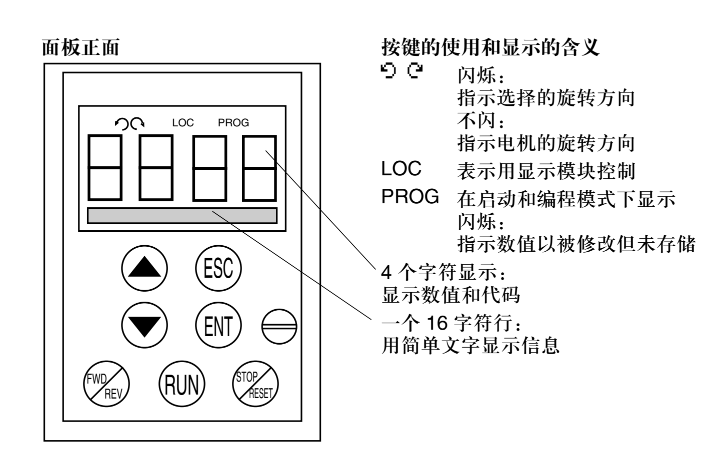
接通变频器电源，它将返回其出厂配置。

简介

面板正面



按键的使用和显示的含义

⟲ ⟳	闪烁： 指示选择的旋转方向 不闪： 指示电机的旋转方向
LOC	表示用显示模块控制
PROG	在启动和编程模式下显示 闪烁： 指示数值以被修改但未存储

4 个字符显示：
显示数值和代码

一个 16 字符行：
用简单文字显示信息

  选择菜单或参数和设置数值



 退回前一菜单或中断当前调整并返回原值

ENT 选择菜单，确认或保存一个菜单项或设置

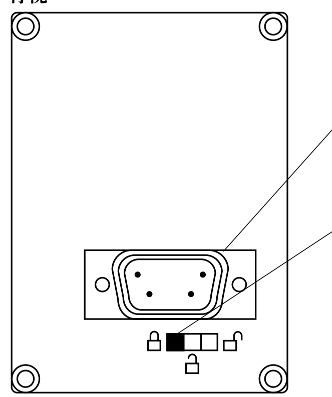
如果选择使用显示模块来控制：

 变换旋转方向

 起动电机命令

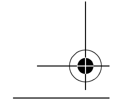
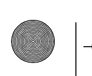
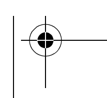
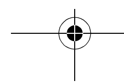
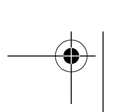
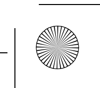
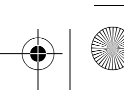
 命令电机停止或复位故障。通过编程（"CONTROL"（控制）菜单）"STOP"键功能被禁止。

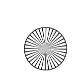
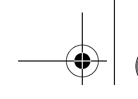
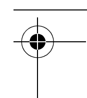
背视



连接座：
- 用于将显示器模块直接连到变频器上
- 用于远程操作，显示模块可通过 VW3A58103 组件中提供的电缆进行连接。

进入锁定开关：
- 位置 🔒：不能进行设置和配置
- 位置 🔒：可进行设置
- 位置 🔓：可以进行设置和配置

使用注意事项 / 最少起动步骤

使用注意事项：

在开始编程之前，首先要填写配置和设置记录表 （在本文件末尾）。

利用内部顺序选择和连锁，可以简化对 Altivar 58 的编程。为了使编程最方便，我们建议您按照下面的顺序读取菜单。不是在所有情况下，都需要这些步骤。

语言
宏 - 配置
识别
控制 （仅限于 3 - 线控制）
I/O 口
控制
传动
故障
通信或应用，如果使用相应的板
调整



注意: 用户必须保证所编程的功能与使用的接线图相符。对于一个已经组装好的变频器 ATV58E，如果出厂设置已被修改，那么这个检查尤其重要；接线图也可能需要作相应的修改。

最少起动步骤：

该步骤适用于：
- 简单用途，适用变频器出厂设置的场合
- 在安装阶段，必须让电机进行试验运转，然后才能进行全面安装。

步骤：

1 按照变频器附带的用户手册中的建议进行，最重要的是将 **50/60Hz** 选择开关按电机的额定频率设置。

2 确认出厂的宏 - 配置是正确的，否则应在 **“MACRO-CONFIG”**菜单中进行修改。

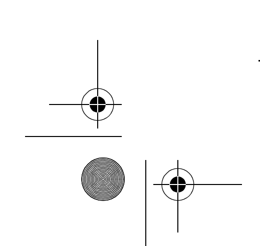
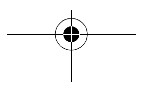
3 对于 “标准力矩”应用中在 200/240 V 时功率额定值高于 7.5 kW 以及在 380/500 V 时功率额定值高于 15 kW 的变频器，应在 **“IDENTIFICATION”**菜单中对功率进行配置。

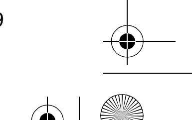
4 要确保达到要求的安全级别，须检查接线图是否与宏 - 配置相符，如不符则修改接线图。

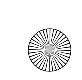
5 检查 **“DRIVE”**菜单中的出厂参数是否与电机铭牌参数相符，不符则要修改。

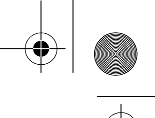
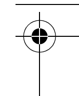
6 在 **“DRIVE”**菜单中，执行自整定程序。

7 如有必要，在 **“ADJUST”**菜单中调整参数 （斜坡、热电流等）。





编程前解除菜单的封锁

进入菜单的级别 / 操作方法

您可以通过设置选择开关的位置进入 3 个菜单级。也可通过口令码对菜单读取进行锁定 （见文件菜单）。

位置 🔒 **显示**：在运行期间使用

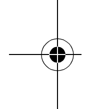
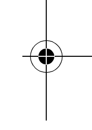
- LANGUAGE 菜单：选择对话语言
- MACRO-CONFIG 菜单：显示宏 - 配置
- IDENTIFICATION 菜单：显示变频器电压和功率
- DISPLAY 菜单：显示电气数据，运行或故障

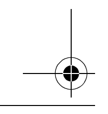
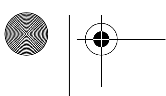
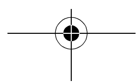
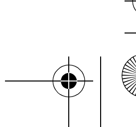
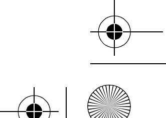
位置 🔒 **显示并设定**：在启动阶段使用

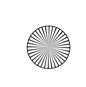
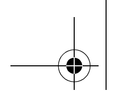
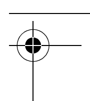
- 执行前一位置允许的所有操作 **level 0**
- **ADJUST** 菜单：设定所有在电机运行时允许调整的参数

位置 🔓 **全部解锁**：在编程时使用

- **在 0 与 1 级中，**执行前两个位置允许的所有操作
- **MACRO-CONFIG** 菜单：改变宏 - 配置
- **IDENTIFICATION** 菜单：可通过由此参数控制的额定值来改变 “标准力矩”或 “高力矩”模式下的功率。
- **DRIVE** 菜单：调整变频器的特性
- **CONTROL** 菜单：配置变频器的操作方式，可通过外引端子、显示模块或 RS485 串行口控制
- **I/O** 菜单：改变 I/O 口的分配
- **FAULT** 菜单：配置电机和变频器的保护功能以及发生故障后的运行方式
- **FILES** 菜单：保存或恢复储存在显示模块中的变频器配置信息，返回出厂设置，或保存您的配置
- **COMMUNICATION** 菜单，如果安装了通信板：调整通信协议的参数
- **APPLICATION** 菜单，如果安装 “用户应用板”。请参见该板相关文件。

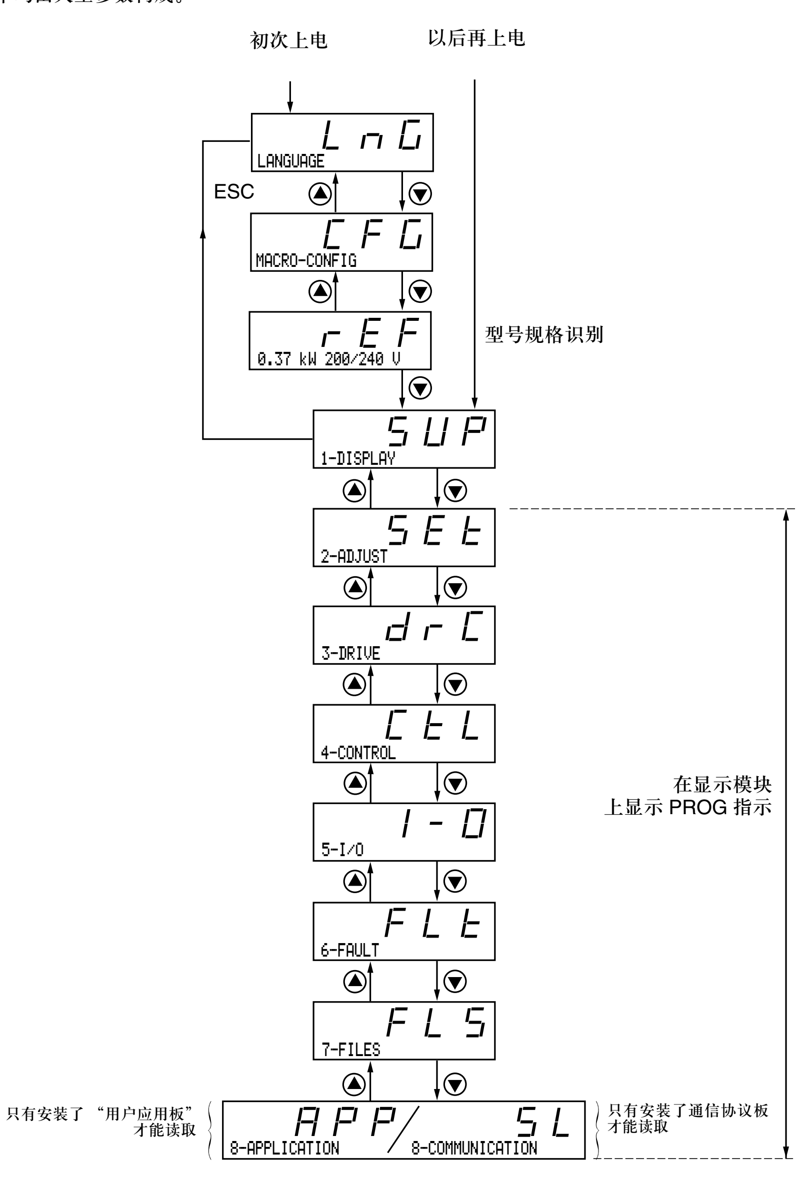



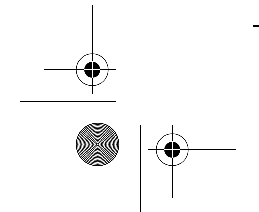
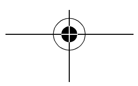
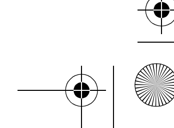




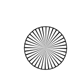
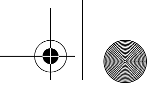
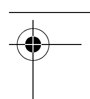
读取菜单

能够读取的菜单个数根据锁定开关的位置决定。
每个菜单均由大量参数构成。



注意：如果已定义了读取口令字，有些菜单仍然是不能修改的，有些甚至看不见。在这种情况下，请参见“FILES 菜单”有关授权的章节解释了如何输入口令字。

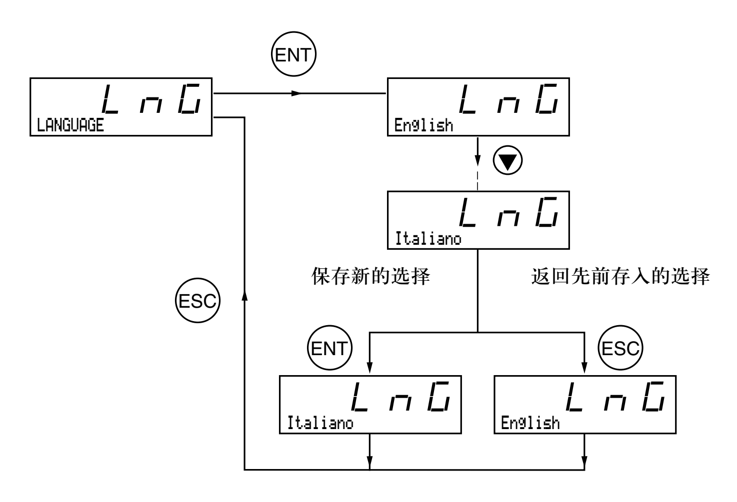





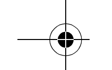
读取菜单－编程方法

语言：

无论开关在什么位置，都可以读取本菜单，并允许在停机或运行中进行修改。

举例：



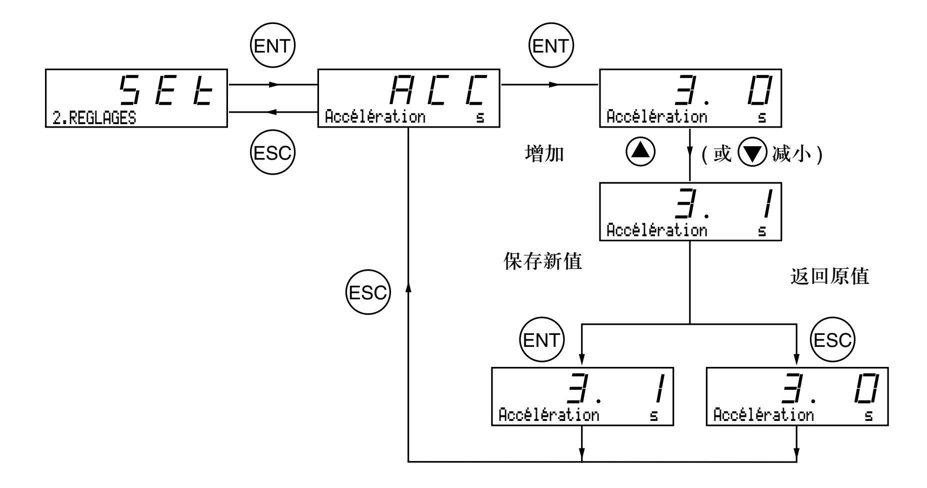


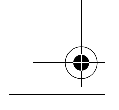
可能的选择：英语 （出厂设置）、法语、德语、西班牙语、意大利语。

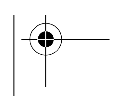
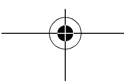
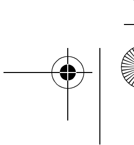
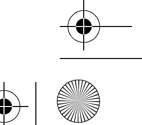
编程方法：

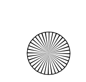
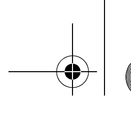
1 级或 2 级菜单编程方法相同：

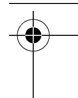
- 1 级：参见上面的 “语言”举例。
- 2 级：参见下面的 “加速斜坡”举例。







宏－配置

该参数总能读取，但只有在编程模式（访问开关在 位置）下，和变频器锁定的停机状态时，才能进行修改。

可用于自动配置一个特定的应用功能。有 3 种应用功能可供选择：

- 物料输送 (Hdg)
- 用于泵与风机类应用 (VT) 的可变力矩
- 一般应用 (GEn)

宏－配置自动定义 I/O 口和参数，激活应用所需要的功能。与编程功能相关的参数都可进行修改。

出厂设置：物料输送方式

变频器：

根据宏 - 配置进行的 I/O 口定义			
	Hdg : Handling	GEn : Gen Use.	VT : Var. Torque
逻辑输入口 LI1	正转	正转	正转
逻辑输入口 LI2	反转	反转	反转
逻辑输入口 LI3	2 个预置速度	点动	给定切换
逻辑输入口 LI4	4 个预置速度	自由停车 **(1)**	直流注入制动
模拟输入口 AI1	求和给定	求和给定	速度给定 1
模拟输入口 AI2	求和给定	求和给定	速度给定 2
继电器输入口 R1	变频器故障	变频器故障	变频器故障
继电器输入口 R2	输出接触器控制	电机到达热状态	频率达设置点
模拟输出口 AO1	电机频率	电机频率	电机频率

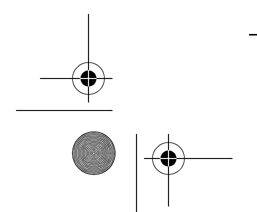
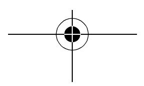
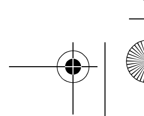
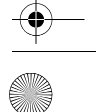
扩展板：

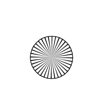
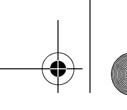
根据宏 - 配置进行的 I/O 口定义			
	Hdg : Handling	GEn : Gen Use.	VT : Var. Torque
逻辑输入口 LI5	8 个预置速度	清除故障	自由停车 **(1)**
逻辑输入口 LI6	清除故障	力矩限幅	斜坡切换
模拟输入口 AI3 或脉冲输入 A, A+, B, B+	求和给定	求和给定	NO
	速度反馈	速度反馈	速度反馈
逻辑输出口 LO	电流达到门槛值	输出接触器控制	到达高速
模拟输出口 AO	电机电流	电机电流	电机电流

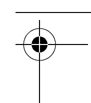
(1) 为了能起动，逻辑输入口必须连在 +24V 上（0V 时该功能激活）



注意：用户必须确保所编辑的宏－配置与使用的接线图相符。对于一个已经装好的变频器 ATV58E，如果出厂设置已被修改，那么这个检查尤其重要；接线图也可能需要作相应修改。




宏－配置

改变宏 - 配置需要确认两次，因其会自动进行定义功能，并返回出厂设置。
显示以下屏幕：

CHG
接线正确吗？ 确认

按 ENT 键执行修改
按 ESC 键返回原设置

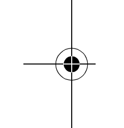
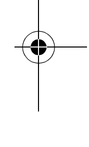
用户定义的配置

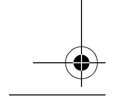
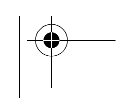
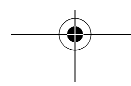
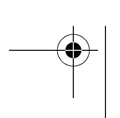
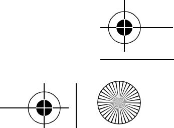
在编程模式下 （读取开关在 位置），用户可以在 I/O 菜单中改变变频器的 I/O 口定义。

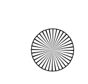
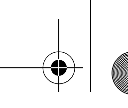
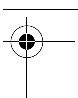
此修改改变了所显示的宏 - 配置数据：

显示

CFG
CUS:Customize

传动规格识别

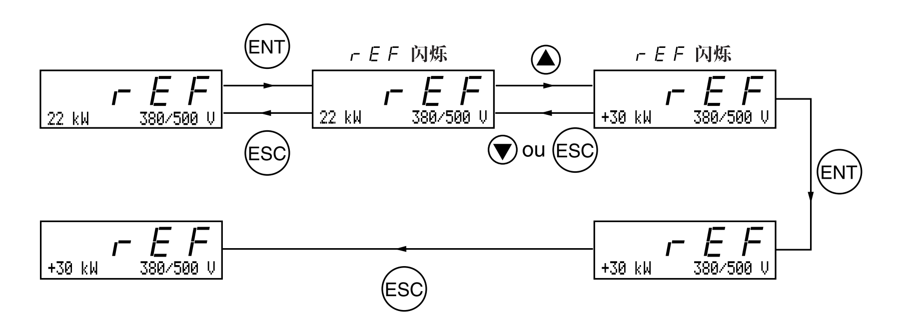
这个参数随时可以显示出来。它指示变频器铭牌上标定的功率和电压。

rEF
0.37 kW 200/240 V

如果频率选择开关选在 50Hz/60Hz，显示的功率值单位是 Kw，变频器设置为 50Hz ；若选择 60Hz，单位则是 HP。

对于在 200/240 V 时额定值高于 7.5 kW 以及在 380/500 V 时额定值高于 15 kW 的变频器：

根据是标准力矩还是高力矩应用，此额定值有所不同。变频器出厂时设置为 “high torque”（高力矩） 。“Standard torque”（标准）配置通过以下方式获得：

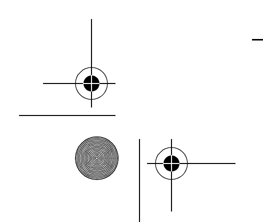
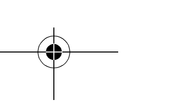
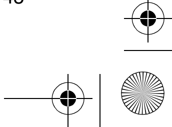


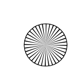
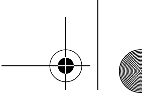
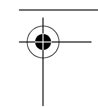
在 “standard torque”（标准力矩）应用中以 kW 为单位的功率前有 “+”号。
要返回 “high torque”配置，可以按照相同的过程进行。
“Standard torque”或 “high torque”配置会对某些参数的 “factory setting”（出厂设定）进行预先配置：

- 变频器菜单：UnS，nCr，nSP，COS，tUn
- 调整菜单：ItH，IdC.



在这两种力矩配置之间改变会导致所有参数返回出厂设定。

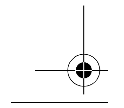
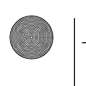
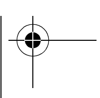
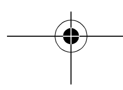
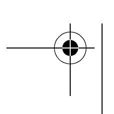
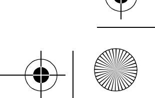




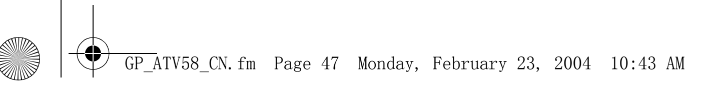





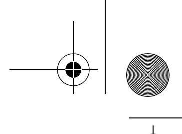
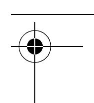

显示菜单 （选择在运行期间显示的参数）

无论开关在什么位置，变频器是处于停止还是运行状态，均可以读取下面的参数：

代码	功能	单位
	Var. State	–
- - - rdY rUn ACC dEC CLI dCb nSt Obr	变频器的状态：指出一个故障或电机的运行阶段： rdY = 变频器准备就绪 rUn = 电机处于静止状态或运行命令已发出而给定参考值为零 ACC = 加速 dEC = 减速 CLI = 电流限幅 dCb = 直流制动 nSt = 自由停车控制 Obr = 按照减速斜坡制动 （见 DRIVE 菜单）	
FrH	Freq. Ref.	Hz
	频率给定	
rFr	Output Freq.	Hz
	输出到电机的频率	
SPd	Motor Speed	rpm
	变频器测算的电机速度	
LCr	MotorCurrent	A
	电机电流	
USP	Mach. speed	–
	变频器测算的机器速度。正比于 rFr，比例系数为 USC，可在调整菜单中调节。可根据应用场合确定显示值的单位 （如米 / 秒）。注意，如果 USP 大于 9999，则显示出的数值将会是除以 1000 以后的结果。	
OPr	Output power	%
	电机输出功率，为变频器估测值。 额定功率定为 100%。	
ULn	MainsVoltage	V
	线电压	
tHr	MotorThermal	%
	马达热状态：电机额定热状态定为 100%。超过 118% 后，变频器触发 OLF 故障 （电机过载）	
tHd	DriveThermal	%
	变频器的热状态：变频器额定热状态定为 100%。超过 118% 后，变频器触发 OHF 故障 （变频器过热）。当低于 70% 后才能复位。	
LFt	Last Fault	–
	显示最后发生的故障	

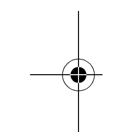
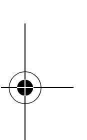







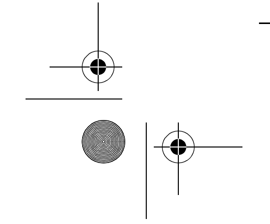
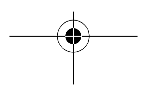
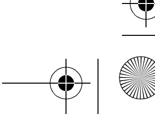
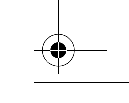


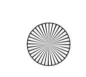
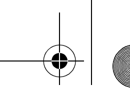



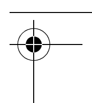

显示菜单

代码	功能	单位
LFr	Freq. Ref.	Hz
	当显示模块控制变频器时，用此参数替代 FrH 参数：LCC 参数在控制菜单中。	
APH	Consumption	kWh 或 MWh
	能耗。	
rtH	Run time	hrs
	连续运行时间 （电机通电），以小时为单位。	



调整菜单



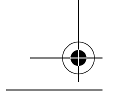
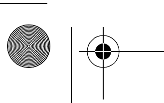
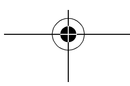
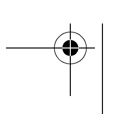
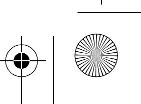
当开关位于 🔒 和 🔓 . 位置时可以读取本菜单。在运行或停止状态都可以修改调整参数。**用户必须确保在运行过程中进行的修改不会造成任何危险；修改最好在停机时进行。**

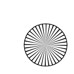
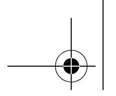
调整参数列表由固定部分和可变部分组成 （渐变的参数），可变部分根据以下条件变化：
- 所选择的宏 - 配置
- 装有 I/O 扩展板
- 重新定义 I/O 口

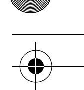
可在所有宏配置中读取下列参数。

代码	说明	调整范围	出厂设置
LFr	Freq. Ref. - Hz	LSP - HSP	–
	用显示模块控制时出现：参数 LCC 在控制菜单中		
ACC dEC	Acceleration - s Deceleration - s	0.05 - 999.9 0.05 - 999.9	3 s 3 s
	加速斜坡时间和减速斜坡时间。 0 值对应于电机额定频率。		
AC2 dE2	Accelerate 2 - s Decelerate 2 - s	0.05 - 999.9 0.05 - 999.9	5 s 5 s
	第二个加速斜坡时间 第二个减速斜坡时间 如果斜坡切换门槛值 （参数 Frt）不是 0 Hz，或者有一个逻辑输入端被定义为斜坡切换，则这些参数可以访问。		
LSP	Low Speed - Hz	0 - HSP	0 Hz
	低速		
HSP	High Speed - Hz	LSP - tFr	50 / 60 Hz，由开关确定
	高速：应确保该设置对电机和应用场合都合适		
FLG	Gain - %	0 - 100	20
	频率闭环增益：用于动态时适应瞬态机械波动。 对于高阻力矩、高惯性或快循环的机器，需要逐渐提高增益。		
StA	Stability - %	0 - 100	20
	用来根据机械动态变化，使其在速度瞬时波动之后回到稳定的状态。逐渐增加稳定性，避免超速。		
ItH	ThermCurrent - A	0.25 - 1.36 In (1)	变频器铭牌值
	用于电机热保护的电流限定值。将 ItH 设为电机铭牌上的数值。		
tdC	DC Inj. Time - s	0 - 30 s Cont	0.5 s
	DC 直流注入制动电流。 如果该参数超过 30s，将显示 “Cont”：永久制动。 30 秒之后注入的电流值将等于 SdC。		

(1) 对应于产品目录和变频器标签上标出的针对高力矩应用场合的变频器额定电流。

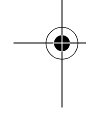
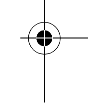





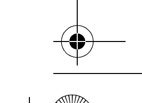
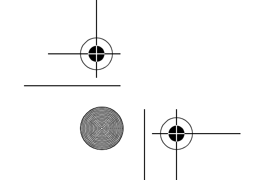
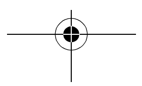
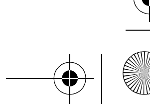


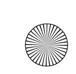
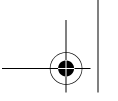
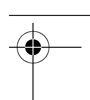
调整菜单

代码	说明	调整范围	出厂设置
SdC	DC stop.curr - A	0.1 - 1.36 In (1)	变频器铭牌值
	tdC = Cont 的条件下 30 秒以后注入的电流。 ⚠ 须检查电机能否耐受该电流而不过热。		
JPF	Jump Freq. - Hz	0 - HSP	0 Hz
	跳频：禁止长时间工作在 JPF 左右 +/- 2.5Hz 范围以外的频率上。该功能可防止达到共振的临界速度。		
JF2	Jump Freq.2 - Hz	0 - HSP	0 Hz
	第 2 跳频：与 JPF 功能相同，针对第 2 个频率值		
JF3	Jump Freq.3 - Hz	0 - HSP	0 Hz
	第 3 跳频：与 JPF 功能相同，针对第 3 个频率值		
USC	Machine Coef.	0.01 - 100	1
	用于参数 rFr （输出到电机的频率）的系数，机器速度通过参数 USP 显示。 USP = rFr x USC		
tLS	LSP Time - s	0 - 999.9	0 （无时间限制）
	低速运行时间。在 LSP 速度下运行一给定时间后，电机自动停机。若频率给定值高于 LSP，且运行命令仍然存在，电机将自动重新起动。 注意：0 值代表无限长时间		

(1) 对应于产品目录和变频器标签上标出的针对高力矩应用场合的变频器额定电流。

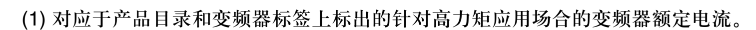






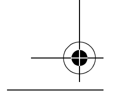
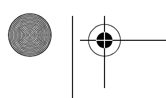
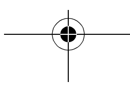
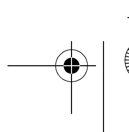
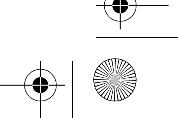
调整菜单

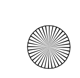
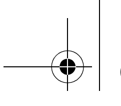
在物料输送宏 - 配置中，可以读取下述参数。

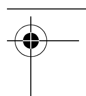
代码	说明	调节范围	出厂设置
UFr	IR Compens. - %	0 - 150% 或 0 - 800%	100%
	用于调整缺省值或自调整过程中测量所得的结果。如果在变频器菜单中 SPC 参数（专用电机）被设置为 “Yes”，则调整范围扩展到 800%。		
SLP	Slip Comp. - %	0 - 150%	100%
	用于调整由电机额定转速确定的滑差补偿值。		
SP2	Preset Sp.2 - Hz	LSP - HSP	10 Hz
	第 2 个预置速度		
SP3	Preset Sp.3 - Hz	LSP - HSP	15 Hz
	第 3 个预置速度		
SP4	Preset Sp.4 - Hz	LSP - HSP	20 Hz
	第 4 个预置速度		
SP5	Preset Sp.5 - Hz	LSP - HSP	25 Hz
	第 5 个预置速度		
SP6	Preset Sp.6 - Hz	LSP - HSP	30 Hz
	第 6 个预置速度		
SP7	Preset Sp.7 - Hz	LSP - HSP	35 Hz
	第 7 个预置速度		
Ctd	Curr.Lev.Att - A	0 - 1.36 In (1)	1.36 In (1)
	电流门槛值，超过该值逻辑输出或继电器变 1		



(1) 对应于产品目录和变频器标签上标出的针对高力矩应用场合的变频器额定电流。



调整菜单

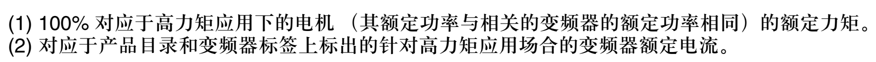


在一般应用宏 - 配置中，可以读取下述参数。

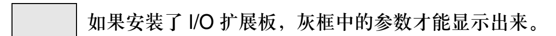
代码	说明	调整范围	出厂设置
UFr	IR Compens. - %	0 - 150% 或 0 - 800%	100%
	用于调整缺省值或自调整过程中测量所得的结果。 如果在变频器菜单中 SPC 参数（专用电机）被设置为 “Yes”，则调整范围扩展到 800%。		
SLP	Slip Comp. - %	0 - 150%	100%
	用于调整由电机额定转速确定的空转补偿值。		
JOG	Jog Freq. - Hz	0 - 10 Hz	10 Hz
	点动频率		
JGt	JOG Delay - s	0 - 2 s	0.5 s
	两次连续点动运行间重复操作延时		
tL2	Trq.Limit 2 - %	0 - 200% (1)	200%
	由逻辑输入激活的第二个力矩限幅值		

在可变宏 - 配置中，可以读取下述参数。

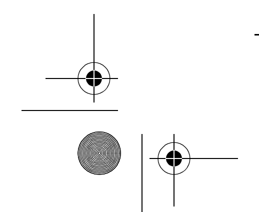
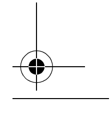
代码	说明	调整范围	出厂设置
IdC	DC Inj.curr - A	0.10 - 1.36 In (2)	变频器铭牌值
	DC 直流注入制动电流。 如果设定了较大的电流值，则在 30 秒之后注入电流将被限制在 0.5 Ith。		
PFL	U/f Profile - %	0 - 100%	20%
	用于在节能功能被禁止时调整电源二次方系数。		

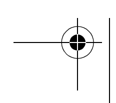
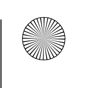


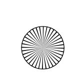
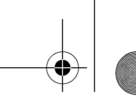
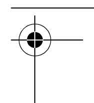
(1) 100% 对应于高力矩应用下的电机（其额定功率与相关的变频器的额定功率相同）的额定力矩。
(2) 对应于产品目录和变频器标签上标出的针对高力矩应用场合的变频器额定电流。



如果安装了 I/O 扩展板，灰框中的参数才能显示出来。

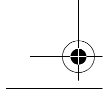
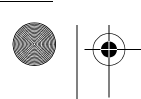
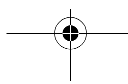
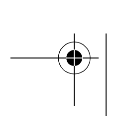
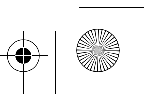




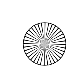
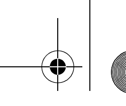
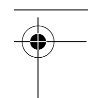
调整菜单

一旦基本产品上的 I/O 口被重新分配，下列参数就可进行访问。

代码	说明	调整范围	出厂设置
AC2	Accel. 2 - s	0.05 - 999.9	5 s
	第二个加速斜坡时间		
dE2	Decel. 2 - s	0.05 - 999.9	5 s
	第二个减速斜坡时间 如果斜坡切换门槛值 （参数 Frt）不是 0 Hz，或者有一个逻辑输入端被定义为斜坡切换，则这些参数可以访问。		
IdC	DC Inj.curr - A	0.10 - 1.36 In (1)	变频器铭牌值
	DC 直流注入制动电流。 如给直流电注入制动分配了一个逻辑输入口，该参数即可以访问。 如果设定了较大的电流值，则在 30 秒之后注入电流将被限制在 0.5 Ith。		
SP2	Preset Sp.2 - Hz	LSP - HSP	10 Hz
	第 2 个预置速度		
SP3	Preset Sp.3 - Hz	LSP - HSP	15 Hz
	第 3 个预置速度		
SP4	Preset Sp.4 - Hz	LSP - HSP	20 Hz
	第 4 个预置速度		
SP5	Preset Sp.5 - Hz	LSP - HSP	25 Hz
	第 5 个预置速度		
SP6	Preset Sp.6 - Hz	LSP - HSP	30 Hz
	第 6 个预置速度		
SP7	Preset Sp.7 - Hz	LSP - HSP	35 Hz
	第 7 个预置速度		
JOG	Jog Freq. - Hz	0 - 10 Hz	10 Hz
	点动频率		
JGt	JOG Delay - s	0 - 2 s	0.5 s
	两次连续点动运行间的反制动逻辑顺序跟踪延时		
brL	BrReleaseLev- Hz	0 - 10 Hz	0 Hz
	制动释放频率		
Ibr	BrRelease I - A	0 - 1.36In(1)	0 A
	制动释放电流		
brt	BrReleasTime- s	0 - 5 s	0 s
	制动释放时间		
bEn	BrEngage Lev- Hz	0 - LSP	0 Hz
	制动开始频率		
bEt	BrEngageTime- Hz	0 - 5 s	0 s
	制动开始时间		

(1) 对应于产品目录和变频器标签上标出的针对高力矩应用场合的变频器额定电流。

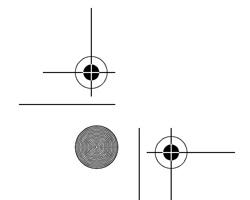
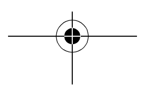
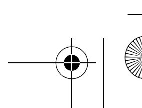
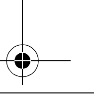




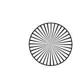
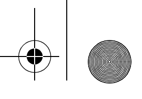
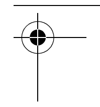
调整菜单

代码	说明	调整范围	出厂设置
FFt	TripThreshNST-Hz	0 - HSP	0 Hz
	自由停机脱扣门槛值：当被要求斜坡停机或快速停机时，所选择的停机类型被激活，直至速度降至此门槛值以下。在此门槛值之下，自由停机被激活。此参数仅在 R2 继电器未被定义为 “BLC: Brake Logic”（制动逻辑）功能且在变频器菜单中已经选择了 “on ramp”（斜坡）或 “fast”（快速）类型停机时可以访问。		
bIP	Brake impul.	No - Yes	No
	制动释放脉冲 YES：制动释放后力矩总为 FW 正向 （forward），而不管要求的转向。 注意：检查电机正转力矩方向与负载增加的方向是否相符；必要时将 2 个电机倒相。 no：制动释放后力矩方向与要求的转向相同。		
dtS	Tacho Coeff.	1 - 2	1
	与测速发电机功能相关的反馈因子： $dtS = \frac{9}{\text{测速机在 HSP HSP 点的电压}}$		
rPG	PI Prop.Gain	0.01 - 100	1
	PI 调节器的积分增益		
rIG	PI Int.Gain	0.01 - 100/s	1 / s
	PI 调节器的比例增益		
FbS	PI Coeff.	1 - 100	1
	PI 反馈因子		
PIC	PI Inversion	No - Yes	No
	PI 调节器校正方向取反 no：正常 yes：取反		
Ftd	Freq.Lev.Att- Hz	LSP - HSP	50/60 Hz
	电机频率门槛值，超过该值逻辑输出变 1		
F2d	Freq.Lev.2 - Hz	LSP - HSP	50/60 Hz
	与 Ftd 功能相同，针对第 2 个频率值		
Ctd	Curr.Lev.Att- A	0 - 1.36 In (1)	1.36 In (1)
	电流门槛值，超过该值逻辑输出或继电器变 1		
ttd	ThermLev.Att- %	0 - 118%	100%
	电机热状态门槛值，超过该值逻辑输出或继电器变 1		
tL2	Trq.Limit 2 - %	0 - 200% (2)	200%
	由逻辑输入激活的第二个力矩限幅值		

(1) 对应于产品目录和变频器标签上标出的针对高力矩应用场合的变频器额定电流。
(2) 100% 对应于高力矩应用下的电机 （其额定功率与相关的变频器的额定功率相同）的额定力矩。

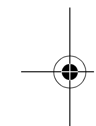
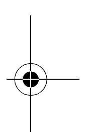
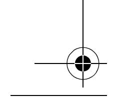
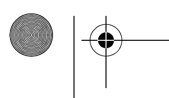
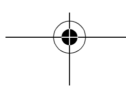
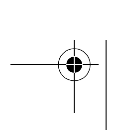
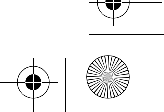
如果安装了 I/O 扩展板，灰框中的参数才能显示出来。

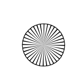
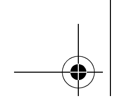





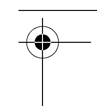




调整菜单

代码	说明	调整范围	出厂设置
PSP	PI Filter - s	0,0 - 10,0	0 s
	用于调整对返回 PI 的滤波时间常数。		
P12	PI Preset 2 - %	0 - 100 %	30 %
	当逻辑输入分配有 4 种预置速度时， PI 采用第二个预置给定值。 100 % = 最大处理值 0 % = 最小处理值		
P13	PI Preset 3 - %	0 - 100 %	60 %
	当逻辑输入分配有 4 种预置速度时， PI 采用第二个预置给定值。 100 % = 最大处理值 0 % = 最小处理值		
dtd	ATV Th. fault	0 - 118 %	105 %
	变频器热状态电平，高于此值逻辑输出或继电器状态将变为 1。		




传动菜单

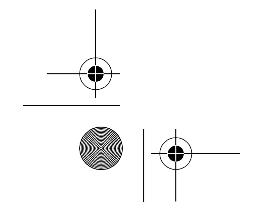
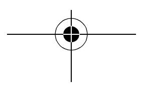
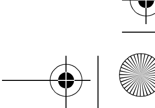
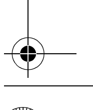
当开关在 🔓 位置时，可以读取本菜单。
只有在变频器锁定停机模式时才可以修改参数。

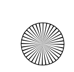
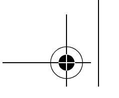
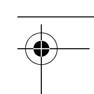
可用下列方法对传动性能进行优化：
- **在传动菜单中输入变频器电机的铭牌数据**
- **执行自整定操作 （用于标准异步电动机）**

当使用特殊电机时 （多台电机并联，锥形转子制动电机，同电动机或同步的异步电动机，静止转子异步电动机）：
- 选择 “Hdg: handling”或 “Gen: General Use”宏－配置。
- 在传动菜单中将特殊电机参数 “SPC”设为 “YES”。
- 在调整菜单中调整 IR 补偿参数 “UFr”直到获得满意的运行为止。

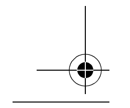
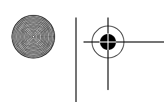
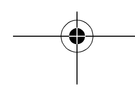
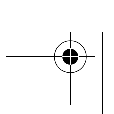
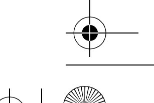
代码	说明	调整范围	出厂设置
UnS	Nom.Mot.Volt - V	200 - 240V 200 - 500 V	230 V (2) 400/460V (2)
	电机铭牌上的额定电压 依据变频器的型号设定电压范围： ATV58 •••• M2 ATV58 •••• N4		
FrS	Nom.Mot.Freq- Hz	10 - 500 Hz	50/60Hz (2)
	电机铭牌上的额定频率		
nCr	Nom.Mot.Curr - A	0.25 - 1.36 In (1)	变频器铭牌值
	电机铭牌上的额定电流		
nSP	Nom.MotSpeed-rpm	0 - 9999 rpm	变频器铭牌值
	电机铭牌上的额定速度		
COS	Mot. Cos Phi	0.5 - 1	变频器铭牌值
	电机铭牌上的功率因数		
tUn	Auto Tuning	No - Yes	No
	用于电机自整定，当本参数设置为 “Yes”时有效。 一旦自整定完成，此参数自动变为 “Done”，如有故障则变为 “No”。 注意：自整定只能在没有激活命令时进行。如果 “自由停车”或 “快速停车”定义了一个逻辑输入口，则该口必须置 1 （0 时为激活状态）。		
tFr	Max. Freq. - Hz	10 - 500 Hz	60/72Hz (2)
	最大输出频率。 最大输出频率取决于开关频率。见 SFR 参数 （传动菜单）。		
nLd	Energy Eco	No-Yes	Yes
	优化电机效率。 只有在可变力矩宏 - 配置中。		

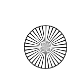
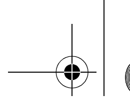
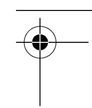
(1) 对应于产品目录和变频器标签上标出的针对高力矩应用场合的变频器额定电流。
(2) 根据 50/60Hz 切换开关的位置。

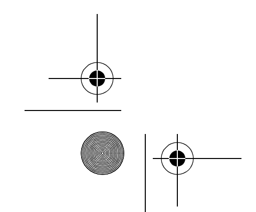
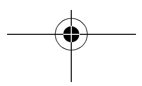
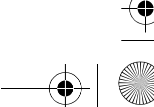
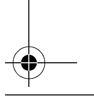
代码	说明	调整范围	出厂设置
Fdb	I lim. Adapt	No-Yes	No
	根据输出频率调整电流限值。 此参数仅在 “variable torque” VT 宏配置中出现 （负载曲线随气体密度变化的通风应用）。		
brA	DecRampAdapt	No-Yes	No
	如果减速时间相对于负载惯性过短，则激活此功能可自动延长减速时间，从而避免 ObF 故障。 在斜坡定位及使用制动电阻时该功能有可能不能使用。 出厂设置取决于使用的宏－配置： No 为物料输送， Yes 为可变力矩和一般用途。 如果继电器 R2 分配给制动顺序功能，参数 brA 将锁定为 No。		
Frt	SwitchRamp2- Hz	0 - HSP	0 Hz
	斜坡切换频率。 一旦输出频率超过 Frt，斜坡时间就会考虑使用 AC2 和 dE2。		
Stt	Type of stop	STN - FST - NST - DCI	STN
	停机类型： 当被要求停机时，停机类型被激活，直至达到 Ftt 阈值 （调整菜单）。 在此阈值之下，自由停机被激活。 Stn: 在斜坡上 Fst: 快速停机 Nst: 自由停机 Dci: 直流注入停机 如果 R2 继电器被定义为 “BLC: Brake Logic”（制动逻辑）功能，则此参数不能访问。		
rPt	Ramp Type	LIN - S - U	LIN
	定义加速减速斜坡形状。 LIN：线性 S : S 型斜坡 U : U 型斜坡 S 型斜坡 （f (Hz), GV, 0, t, t2, t1） 曲线斜率固定 t2 = 0.6 x t1 t1 = 设定的斜坡时间 U 型斜坡 （f (Hz), GV, 0, t, t2, t1） 曲线斜率固定 t2 = 0.5 x t1 t1 = 设定的斜坡时间		
dCF	DecRAmpCoeff	1 - 10	4
	快速停车功能激活时，减速斜坡时间缩减系数。		

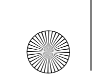
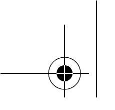
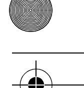
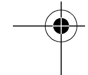






代码	说明	调整范围	出厂设置
tLI	Trq.Limit _ %	0 - 200% (1)	200%
	力矩限幅用于限制电机的最大力矩。		
CLI	nt. I Lim - A	0 - 1.36 In (2)	1.36 In
	电流限幅用于限制电机过热。		
AdC	Auto DC Inj.	No-Yes	Yes
	停车时自动直流注入制动无效。		
PCC	Motor P Coef	0.2 to 1	1
	当已经将一个逻辑输入定义为电机切换功能时，应确定变频器额定功率与一个较低功率电机的关系。		
SFt	Sw Freq. Type	LF-HF1-HF2	LF
	用于选择低开关频率 （LF）或高开关频率 （HF1 或 HF2）。 HF1 适用于变频器没有降容使用的低负载情况。如果变频器的热状态超过 95%，变频器将自动切换到 2 或 4kHz （根据铭牌值而定）。如果变频器的热状态退回至 70%，变频器将自动恢复原开关频率。 HF2 适用于重负载下变频器降容一级适用的情况：传动参数自动换算 （力矩限幅、热电流等）。 ⚠ **修改该参数将使下面参数回到出厂设置：** **• nCr， CLI， Sfr， nrd （传动菜单）** **• ItH， IdC， Ibr， Ctd （调整菜单）。**		
SFr	Sw Freq. - kHz	0.5-1-2-4-8-12-16 kHz	变频器铭牌值
	用于选择开关频率。调整范围取决于 SFt 参数。 若 SFt=LF：根据变频器铭牌选择 0.5 至 2 或 4kHz 若 SFt=HF1 或 HF2：根据变频器铭牌选择 2 或 4 至 16kHz 最高运行频率 （tFr）受到开关频率限制： SFr(kHz) 0.5 1 2 4 8 12 16 tFr (Hz) 62 125 250 500 500 500 500		
nrd	Noise Reduct	No-Yes	(3)
	此功能用于随机地调制开关频率以降低电机噪音。		
SPC	Special motor	No-Yes	No
	此功能选择 “yes”可扩展调整菜单中 UFr 参数的调整范围，用于适配本节开始处所提到的专用电机。只能在 “Handling”（物料输送）和 “General use”（一般应用）宏配置中访问。 NO：一般电机 YES：专用电机 PSM：小型电机		

(1) 100% 对应于高力矩应用下的电机 （其额定功率与相关的变频器的额定功率相同）的额定力矩。
(2) 对应于产品目录和变频器标签上标出的针对高力矩应用场合的变频器额定电流。
(3) 如果 SF=LF 为 Yes，如果 SFt=HF1 或 HF2 为 No。

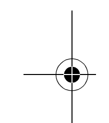
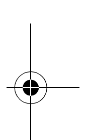
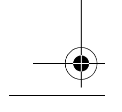





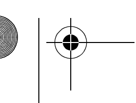
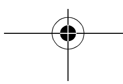
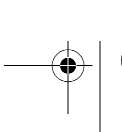
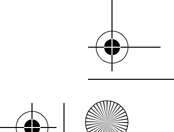





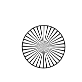
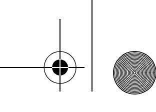
传动菜单

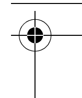
代码	说明	调整范围	出厂设置
PGt	PG Type	INC-DET	DET
	当安装编码器反馈 I/O 选项板后，定义使用的传感器类型： INC：增量编码器 （硬件连接 A， A+， B， B+ 脉冲） DET：探测器 （只有 A 为硬件连接）		
PLS	Num. Pulses	1 - 1024	1024
	定义编码器转一圈产生的脉冲次数 （编码器反馈 I/O 选项板）。		

如果安装了 I/O 扩展板，灰框中的参数才能显示出来。



控制菜单

当开关在 位置时，可以读取本菜单。只有当变频器锁定的停机状态才能修改这些参数。

代码	说明	调整菜单	出厂设置
tCC	TermStripCon	2W - 3W （2 线 / 3 线）	2W

控制端子的配置：2 线或 3 线控制。

⚠ 由于对该参数的修改会导致逻辑输入口重新定义，故需要进行两次确认。从 2 线控制变为 3 线控制时，逻辑口定义是由一个输入转换的。 2 线控制中的 LI3 定义变成 3 线控制中的 LI4 定义。 3 线控制中的 LI1 和 LI2 口则不能重新定义。

I/O	物料输送	一般应用	可变力矩
LI1	停止	停止	停止
LI2	正向运行	正向运行	正向运行
LI3	反向运行	反向运行	反向运行
LI4	2 个预置速度	点动运行	给定切换
LI5	4 个预置速度	自由停车	直流制动
LI6	8 个预置速度	清除故障	自由停车

安装了 I/O 扩展板，才能读取灰色背景的 I/O 参数。
3 线控制 （脉冲控制信号：一个脉冲足以控制起动）。该选项禁止 “自动重新起动”功能。
接线举例：
LI1：停止
LI2：正向
LI3：反向

ATV-58 控制端子
24 V LI1 LI2 LIx

该选项仅在 2 线控制方式时才显示出来。

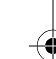
代码	说明	调整范围	出厂设置
tCt	Type 2 Wire	LEL-TRN-PFo	LEL

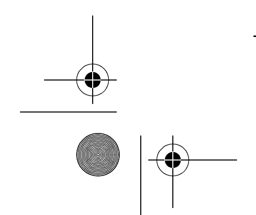
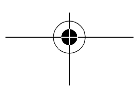
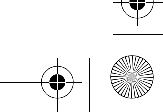
定义 2 线控制：
- 根据逻辑输入口的状态 （LEL：2 线）
- 根据逻辑输入口的状态变化 （TRN：2 线传送）
- 根据逻辑输入口的状态，且正转总是优先于反向 （Pfo：FW 正向优先）。

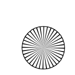
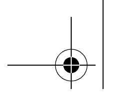
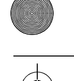
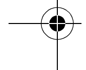
接线举例：
LI1：正向
LIx：反向

ATV-58 控制端子
24 V LI1 LIx

如果安装了 I/O 扩展板，灰框中的参数才能显示出来。

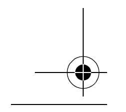
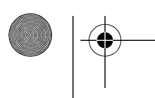
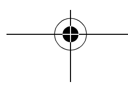
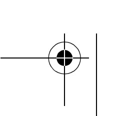
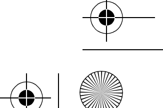


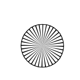
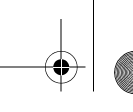
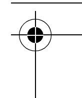




控制菜单

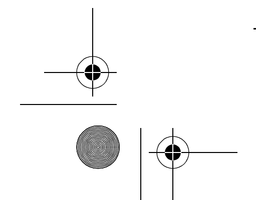
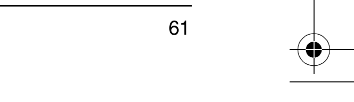
代码	说明	调整范围	出厂设置
rIn	RV Inhib.	No - Yes	No
	• 禁止由逻辑输入口控制反向运行，即使求和或过程控制功能需要反向运行也不行。 • 禁止由显示模块上的 FWD/REV 键控制反向运行。		
bSP	deadb./pedst	No BNS：底座 BLS：死区	No
	低速下运行管理： F: 电机频率 HSP LSP 0 No 给定值 100 % F : 电机频率 HSP LSP 0 底座 给定值 100 % F: 电机频率 HSP LSP 0 死区 给定值 100 %		
CrL CrH	AI2 min Ref.- mA AI2 Max. Ref- mA	0 - 20 mA 4 - 20 mA	4 mA 20 mA
	AI2 输入信号的最小值和最大值。 这两个参数用于定义送入 AI2 的信号。有几种配置方案，其中一种是配置输入为 0 - 20 mA，4 - 20 mA， 20 - 4 mA 等信号。 频率 HSP LSP 0 CrL CrH 20 AI 2 (mA)		

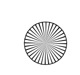
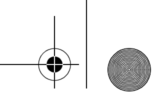
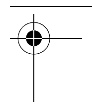






代码	说明	调整范围	出厂设置
AOL AOH	AO Min. Val- mA AO Max. Val- mA	0 - 20 mA 0 - 20 mA	0 mA 20 mA
	参数 / 最大 / 0 / AO (mA) / AOL / AOH / 20 AO 和 AO1 （1）输出信号的最小值和最大值。 这两个参数用于定义 AO 和 AO1 口上的输出信号。 例如：0 - 20 mA， 4 - 20 mA， 20 - 4 mA 等。		
Str	Save Ref.	NO-RAM-EEP	NO
	与 +/- 速度功能配合使用，该功能用来存储给定值： 当运行命令消失 （存入 RAM），或当电源消失时 （存入 EEPROM）存储给定值。 下一次起动时，速度给定值就是上次存储的值。		
LCC	Keypad Comm.	No-Yes	No
	通过显示模块激活变频器。STOP/RESET、RUN 和 FWD/REV 键都是有效的。速度给定由参数 LFr 给出。只有自由停车、快速停车和直流注入停车命令仍留给终端控制。如果变频器和显示模块间的连接被切断，则变频器将锁定在 SLF 故障状态。		
PSt	STOP Priorit	No-Yes	Yes
	此功能预先赋予 STOP 键，而不考虑控制模式 （无论是端子还是现场总线）。设置 PSt 参数为 “No”： 1 - 显示 “No” 2 - 按 “ENT”键 3 - 变频器显示 “See manual”（见手册） 4 - 按 ▲，然后按 ▼，再按 “ENT”键。 对于连续处理过程的应用，建议将此键设为无效 （设为 “No”）。		
Add	DriveAddress	0 - 31	0
	通过连接端口 （带有显示模块并且可编程终端已拆除）控制时的变频器地址。		
tbr	BdRate RS485	9600-19200	19200
	通过 RS485 串行连接的传输速度 （在下一次通电时有效） 9600 bps 19200 bps ⚠ **如果 tbr ¦ 19200，则终端将不能再使用。要重新激活终端，应通过串行连接将 tbr 重新配置为 19200，或者将其返回出厂设定 （见 37 页）。**		
rPr	Reset counters	No-APH-RTH	No
	KWh 或运行时间复位为 0 No: 否 APH: KWh 复位为 0 RTH: 运行时间复位为 0 APH 和 RTH 立即生效。参数即自动返回 NO。 按 “ENT”确认复位为 0 的命令。		

(1) 如果安装有 I/O 扩展卡则模拟输出 AO 出现。

I/O 菜单

开关在 位置时该菜单可以读取。
只有在变频器锁定的停止模式下才能对 I/O 口进行定义。

代码	功能
L I2	LI2 Assign.
	见功能汇总表及其说明。

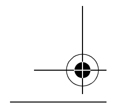
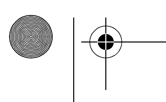
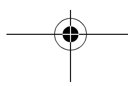
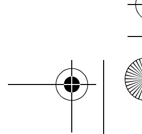
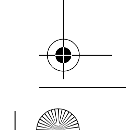
菜单中提供的输入输出口取决于变频器中的 I/O 板 （如果安装）以及先前在控制菜单中作的选择有关。
“工厂”配置是由所选的宏 - 配置预先定义的。

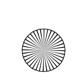
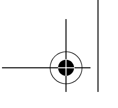
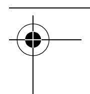
输入口可能的配置分配汇总表 （2 线 / 3 线选项除外）

I/O 扩展选项板		2 个逻辑输入口 L15-L16
不带选项板的变频器		3 个逻辑输入口 L12-L14
NO:Not assigned	（无定义）	X
RV :Reverse	（反向运行）	X
RP2:Switch Ramp2	（斜坡开关）	X
JOG	（点动运行）	X
+SP: + Speed	（+ 速度）	X
-SP: - Speed	（- 速度）	X
PS2: 2 Preset SP	（2 个预置速度）	X
PS4: 4 Preset SP	（4 个预置速度）	X
PS8: 8 Preset SP	（8 个预置速度）	X
RFC:Auto/manu	（给定切换）	X
NST:Freewhl Stop	（自由停车）	X
DCI:DC inject.	（直流制动）	X
FST:Fast stop	（快速停车）	X
CHP:Multi. Motor	（电动机切换）	X
TL2:Trq.Limit 2	（第 2 力矩限幅）	X
FLO:Forced Local	（强制本机运行模式）	X
RST:Fault Reset	（故障清除）	X
ATN:Auto-tune	（自动整定）	X
PAU:PI Auto/Manu	（PI 自动 / 手动）若一个 AI=PIF	X
PR2:PI 2 Preset	（2 个 PI 预设定点）若一个 AI=PIF	X
PR2:PI 4 Preset	（4 个 PI 预设定点）若一个 AI=PIF	X
TLA:Torque limit	（由 AI 限制力矩）若一个 AI = PIF	X
EDD:Ext flt.	（外部故障）	X



注意：如果 “自由停车”或 “快速停车”已定义有一个逻辑输入口，则起动时只能将此口接在 +24V 电压上，输入口电平为 0 时这些停止功能是激活的。

I/O 菜单

可配置输入口和编码器输入口分配总表

I/O 扩展选项板			模拟输入 AI3	编码器输入 A+, A-, B+, B-(1)
不带选项板的变频器		模拟输入 AI2		
NO:Not assigned	（无定义）	X	X	X
FR2:Speed Ref2	（速度给定 2） 若一个 LI = RFC	X		
SAI:Summed Ref.	（求和给定）	X	X	X
PIF:PI Regulator	（PI 调节器反馈）	X	X	
PIM:PI Man.ref.	（手动 PI 速度给定） 若一个 AI=PIF 和一个 LI = PAU	X		
SFB:Tacho feedbk	（测速发电机）		X	
PTC:Therm.Sensor	（PTC 传感器）		X	
ATL:Torque Lim.	（力矩限幅）		X	
RGI:PG feedbk	（编码器或传感器反馈）			X

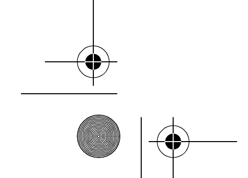
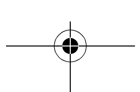
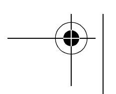
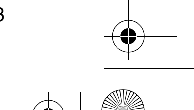
(1) NB：定义编码器输入口 A+、 A-、 B+、 B- 的菜单名为 “Assign AI3”。

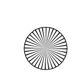
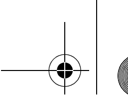


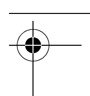
注意：如果继电器输出 R2 被定义为 “制动顺序”，且装有测速板，则在出厂设置中 AI3 被自动指定为测速发电机反馈。不过 AI3 口仍然可以重新定义。

可配置输出口总表

I/O 扩展选项板			逻辑输出口 LO
不带选择件的变频器		继电器 R2	
NO:Not assigned	（无定义）	X	X
RUN:DriveRunning	（变频器运行）	X	X
OCC:OutputCont.	（输出接触器控制）	X	X
FTA:Freq Attain.	（达到频率门槛值）	X	X
FLA:HSP Attained	（达到 HSP）	X	X
CTA:I Attained	（达到电流门槛值）	X	X
SRA:FRH Attained	（达到频率给定值）	X	X
TSA:MtrTherm Lvl	（达到电机热门槛值）	X	X
BLC:Brk Logic	（制动顺序）	X	
APL:4-20 mA loss	（4-20 mA 信号丢失）	X	X
F2A:F2 Attained	（达到第 2 频率门槛值）	X	X
TAD:ATV th. Alarm	（达到传动热门槛值）	X	X

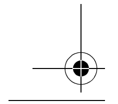


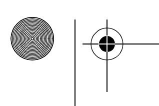
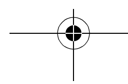
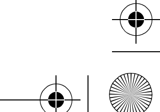
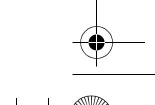

模拟输出口分配总表

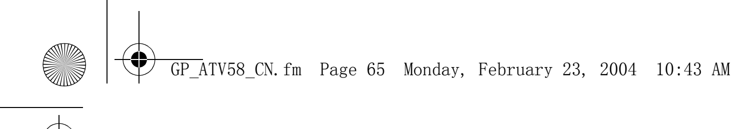
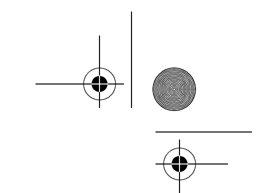
I/O 扩展选项板		模拟输出口 AO
不带选择件的变频器		模拟输出口 AO1
NO :Not assigned	（无定义）	X
OCR:Motor Curr.	（电机电流）	X
OFR:Motor Freq	（电机速度）	X
ORP:Output ramp	（斜坡输出）	X
TRQ:Motor torque	（电机力矩）	X
STQ:Signed Torq.	（带符号电机力矩）	X
ORS:Signed ramp	（带符号斜坡输出）	X
OPS:PI ref.	（PI 设定点输出）若一个 AI=PIF	X
OPF:PI Feedback	（PI 反馈输出）若一个 AI=PIF	X
OPE:PI Error	（PI 误差输出）若一个 AI=PIF	X
OPI:PI Integral	（PI 积分输出）若一个 AI=PIF	X
OPR:Motor power	（电机功率）	X
THR:Motor Thermal	（电机热状态）	X
THD:Drive Thermal	（变频器热状态）	X

一旦 I/O 口被重新定义，相关功能的参数就会自动显示在菜单中，且宏 - 配置将显示“CUS:Customize”。某些修改会增加新的调整参数，用户请勿忘记在调整菜单中设置下列参数：

I/O		定义	设置的参数
LI	RP2	斜坡开关	AC2 dE2
LI	JOG	点动运行	JOG JGt
LI	PS4	4 个预置速度	SP2 - SP3
LI	PS8	8 个预置速度	SP4 - SP5 - SP6 - SP7
LI	DCI	直流制动	IdC
LI	TL2	第 2 个力矩限幅	tL2
LI	PR4	4 个预置 PI 设定点	PI2 - PI3
AI	PIF	PI 调节器反馈	rPG - rIG - PIC - rdG - rEO - PrG - PSr - PSP - PLr - PLb
AI	SFB	测速发电机	dtS
R2	BLC	制动顺序	Ibr - brt - bEn - bEt - brL - bIP
LO/R2	FTA	达到频率门槛值	Ftd
LO/R2	CTA	达到电流门槛值	Ctd
LO/R2	TSA	电机达到热门槛值	ttd
LO/R2	F2A	达到第 2 个频率门槛值	F2d
LO/R2	TAD	达到变频器热门槛值	dtd



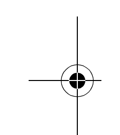
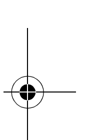





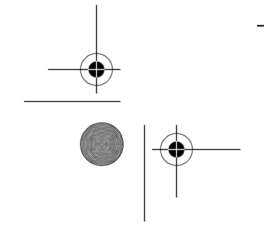
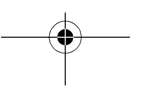
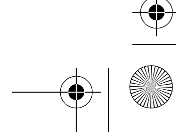



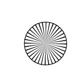
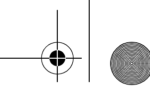
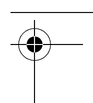

I/O 菜单

某些接口的重定义会导致加入新的调整参数，用户必须在控制、传动或故障菜单中对其进行配置。

I/O		定义	设置的参数
LI	-SP	速度	Str （控制菜单）
LI	FST	快速停车	dCF （传动菜单）
LI	RST	故障复位	rSt （故障菜单）
AI	SFB	测速发电机	Sdd （故障菜单）
A+, A-, B+, B-	SAI	求和给定	PGt, PLS （传动菜单）
A+, A-, B+, B-	RGI	PG 反馈	PGt, PLS （传动菜单）

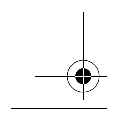
功能兼容表

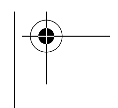
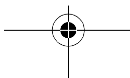
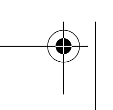
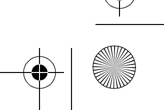
应用功能的选择可能会由一些功能之间不兼容性加以限制。本表未列出的功能均完全兼容。

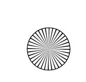
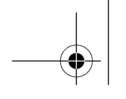
	DC 直流制动	求和输入口	PI 调节器	+ / - 速度	给定切换	自由停车	快速停车	点动运行	预置速度	带测速发电机或编码器的速度调节	使用 AI3 口输入的力矩限幅	用 LI 口输入的力矩限幅
DC 直流制动						↑						
求和输入口					●							
PI 调节器								●	●	●		
+ / - 速度					●			↑	●			
给定切换		●		●					●			
自由停车	←						←					
快速停车						↑						
点动运行			●	←					←			
预置速度			●	●	●			↑				
带测速发电机或编码器的速度调节			●									
使用 AI3 口输入的力矩限幅												●
使用 LI 口输入的力矩限幅											●	

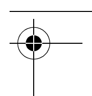
符号	说明
●	不兼容的功能
	兼容的功能
(灰色)	不适用
← ↑	优先功能 （不能同时被激活的功能）： 箭头指向的功能优先于其它功能。

停止功能优先于启动命令。
由逻辑输入口给出的速度给定优先于模拟给定。





可配置 I/O 口的应用功能

逻辑输入口应用功能

运行方向：正向 / 反向
如果电机只需单向运行，则可以禁止反向运行功能。

2 线控制
运行和停止都由同一个逻辑输入口控制，即 1 态 （运行）或 0 态 （停止），或者是状态的改变 （参见 2 线控制菜单）。

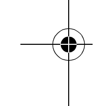
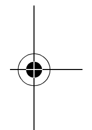
3 线控制
运行和停止由两个不同的逻辑输入口控制。 LI1 总是被定义为停止功能。当此口处于开路状态 （0 态）时，表示已停止运行。

运行命令输入口的脉冲一直储存到停止输入口开路为止。

在上电、手动或自动进行故障复位期间，电机只能由复位后的电源供电。复位命令优先于 “正转” 、“反转”和 “直流注入制动”命令。

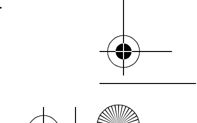
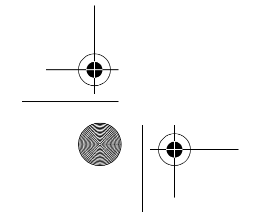
斜坡切换：斜坡 1：ACC， DEC ；斜坡 2：AC2， DE2
可使用两种激活方式：
用逻辑输入口 LIx 激活
通过检测一个可调节的门槛值激活

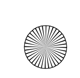
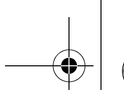
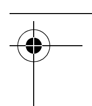
如果定义一个逻辑输入口为此功能，则只有这个输入口才能操作斜坡开关。

点动运行 （“JOG”）：低速运行脉冲
如果 JOG 接点闭合，运行方向接点有效，则不论 ACC、Dec、AC2、De2 设定为何值，斜坡时间就是 0.1s。
如果方向触点也闭合同时 JOG 接点有效，则使用所设置的斜坡值。

在调整菜单里可读取的参数：
- JOG 速度
- 反重复延时 （在 2 个 “JOG”命令之间的最短间隔时间）。

+ / - 速度 （升 / 降速）：有两种操作方式。

1 使用单动作按钮：除运行方向外，还需要两个逻辑输入口。一个定义为 “+speed” 升速命令，另一个定义为 “-speed” 降速命令。

此功能与控制菜单中的 Str 给定值存储功能有关。

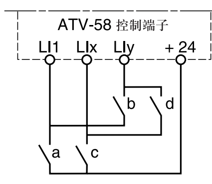
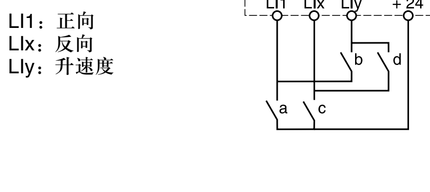
2 使用双击动作按钮：只需定义一个 “+speed （加速度）” 逻辑输入口即可。用双击键来实现 + / - speed 功能：

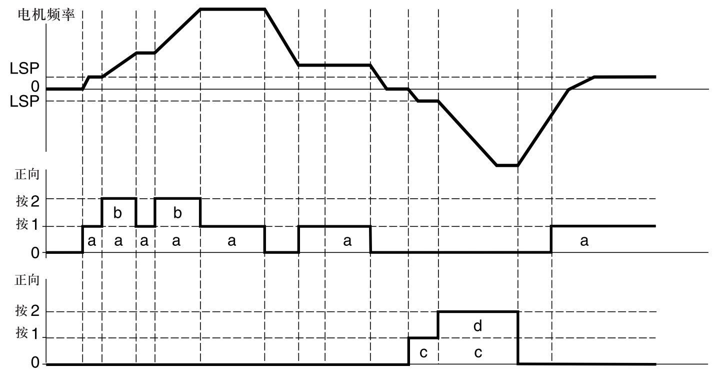
说明：1 个键在一个旋转方向上按两次。
每个动作闭合一个接点。

	释放 （降速度）	按下 1 （速度保持）	按下 2 （升速度）
正向按钮	–	a	a 和 b
反向按钮	–	c	c 和 d

接线举例：

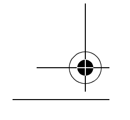
LI1：正向
LIx：反向
LIy：升速度

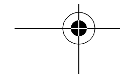
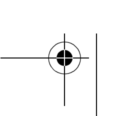
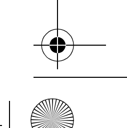



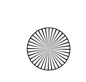
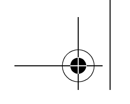
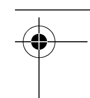


+/-speed 方式与 3 线控制不兼容。在这种情况下，降速功能被自动定义最高检索的逻辑输入口 （例如：LI3 （加速）， LI4 （减速））。

在这两种情况下，最高速度由模拟输入口提供的给定值来确定。例如，AI1 连接到 +10V。



可配置 I/O 口的应用功能

预置速度：
可以预置 2 个、 4 个或 8 个速度，分别需要使用 1 个、 2 个或 3 个逻辑输入口。

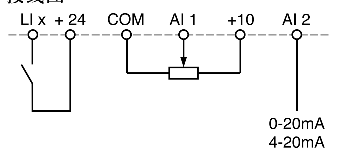
必须按下列顺序进行定义：首先 PS2 （LIx），其次 PS4 （LIy），最后 PS8 （LIz）。

2 个预置速度		4 个预置速度			8 个预置速度			
定义：LIx 给 PS2		定义：LIx 给 PS2， LIy 给 PS4			定义：LIx 给 PS2， LIy 给 PS4，LIz 给 PS8			
LIx	速度给定	LIy	LIx	速度给定	LIz	LIy	LIx	速度给定
0	LSP+ 给定值	0	0	LSP+ 给定值	0	0	0	LSP+ 给定值
1	HSP	0	1	SP2	0	0	1	SP2
		1	0	SP3	0	1	0	SP3
		1	1	HSP	0	1	1	SP4
					1	0	0	SP5
					1	0	1	SP6
					1	1	0	SP7
					1	1	1	HSP

为解除逻辑输入口的定义，必须按下面的顺序进行：PS8(LIz)， PS4(LIy)，最后 PS2(LIx)。

给定切换
由逻辑输入口给出两个给定值 （AI1 和 AI2 给定值）的切换命令。
该功能自动定义 AI2 为速度给定值 2。

接线图

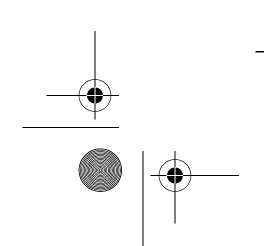
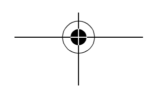
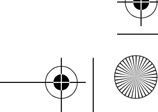
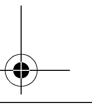


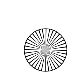
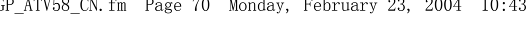
打开接点，给定值 =AI2
闭合接点，给定值 =AI1

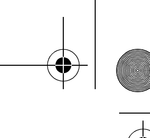
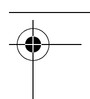
自由停车
电机仅在阻力矩作用下停车。电机电源切断。
当逻辑输入口开路 （0 态）时，便开始自由停车。

直流注入制动
当逻辑输入口闭合 （1 态）时，开始制动停车。

快速停车
按照减速斜坡时间制动停车，斜坡时间乘以了传动菜单中的缩减系数 dCF。
当逻辑输入口开路 （0 态）时，开始快速停车。

电机切换
此功能用于两个不同额定容量的电机使用同一台变频器时，在两个电机之间进行切换。变频器的输出必须有一个适当的顺序。在电机停下和变频器被封锁时才能进行切换。下面的内部一个逻辑命令自动切换：

- 电机额定电流
- 制动释放电流
- 直流制动电流

这个功能自动地禁止第二台电机的热保护功能。
可输入的参数：在传动菜单中的电机功率之比 (PCC)。

第二个力矩限幅：
当逻辑输入口激活时，电机最大力矩将降低。
参数 tL2 在调整菜单中。

故障复位：
有两种复位方法：部分复位和总复位 （参数 rSt 在故障菜单中）。
部分复位 (rSt = RSP)：
如果故障已消除，用于清除故障存储，并使变频器复位。
可部分复位的故障有：

- 电源过压
- 直流过压
- 电机缺相
- 全面检修
- 通信故障
- 电机过载
- 4-20mA 信号丢失
- 外部故障
- 电机过热
- 串行连接故障
- 变频器过热
- 超速

总复位 (rSt = RSG)：
当所定义的逻辑输入口闭合时，**禁止除 SCF （电机短路电流）之外的所有故障 （强制运行）**。

强制本机模式
用于在本机模式 （通过端子或显示模块控制）和线控模式 （串行口）之间切换。

自整定
当定义的逻辑输入口变 1 时，触发自整定功能，同时 “驱动”菜单中的参数 tUn 也变为有效。

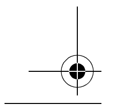
注意：自整定只能在没有激活其他命令时才能进行。如果一个逻辑输入口已定义给 “自由停车”或 “快速停车”功能，该输入口必须设为 1 （0 为激活）。

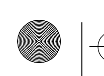
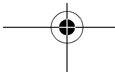
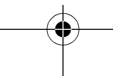
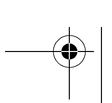
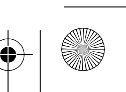
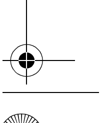

应用：例如在切换电机时。

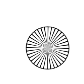
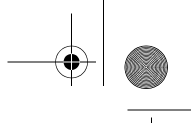
自动 - 手动 PI、预置 PI 设定点：PI 操作。

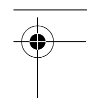
由模拟输入给出的力矩限制
此功能仅在模拟输入 AI3 被定义为力矩限制时可以使用。如果在 TL2 : second torque limit （第 2 力矩限制）上没有配置逻辑输入，则此限制直接由 AI3 给出。
如果在 TL2 : second torque limit （第 2 力矩限制）上配置了一个逻辑输入：
- 当此输入为 0 时限制值由 tLi 给出
- 当此输入为 1 时限制值由 AI3 给出。

外部故障
当所定义的逻辑输入变为 1 时，电机停机（根据 Drive 菜单中的 LSF Stop+flt 参数的配置），且变频器将锁定在 EPF 外部故障模式。





可配置 I/O 口的应用功能

模拟输入口应用功能

AI1 输入口总是作为速度给定。

AI2 和 AI3 的定义

求和速度给定：由 AI2 和 AI3 给定的频率设定值以与 AI1 的值相加。

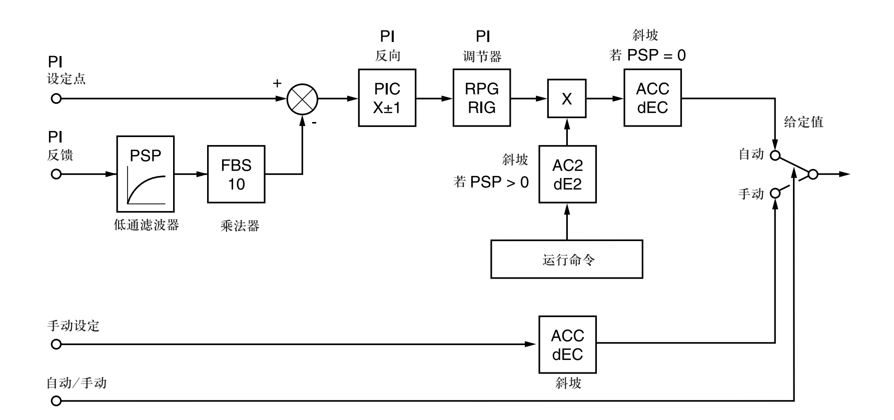
使用测速发电机的速度调节：（只有带模拟输入口的 I/O 扩展板才定义 AI3）
需要一个外部整流桥对测速发电机电压进行适配。最大电压须在 5-9V 之间。然后，设置调整菜单中的 dtS 参数以获得精确的设定值。

PTC 传感器的处理：（只有带有模拟输入口的 I/O 扩展板）。将电机绕组中的 PTC 传感器的信号连接到模拟输入口 AI3，对电机直接热保护。
PTC 传感器特性：
20°C 下，传感器回路的总电阻 = 750 W。

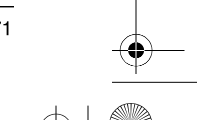
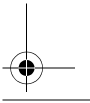
PI 调节器：用于调节有给定值和传感器反馈输入的过程。速度输入给出一个初始 （或预期）起动设定点。在 PI 模式中，即使配置不同，斜坡也均为线性。
使用 PI （比例积分）调节器，可以：
- 通过 FbS 调整反馈。
- 校正 PI 倒置。
- 调整比例和积分增益 （RPG 和 RIG）。
- 为 PI 基准、 PI 反馈和 PI 误差定义一个逻辑输入。
- 如果 PSP > 0 则应用一个斜坡来确定起动时 PI （AC2）的作用。
  如果 PSP = 0 则有效斜坡为 ACC/dEC。在停机时总是使用 dEC 斜坡。

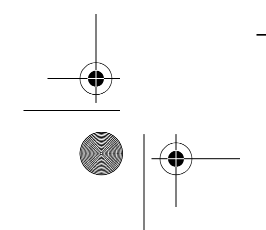
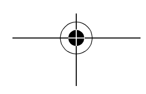
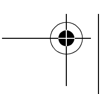
电机速度被限制在 LSP 和 HSP 之间。

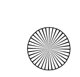
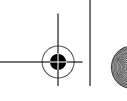
注意：若有一个 AI 输入口定义为 PI 反馈，则 PI 调节器模式为激活状态。此模拟输入的定义只能在禁止所有与 PI 不相容功能后进行。

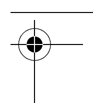


Auto/Man （自动 / 手动）：此功能仅在 PI 功能有效时才能使用，而且需要有带有模拟输入的 I/O 扩展卡。通过逻辑输入 LI，它被用于切换操作：如果 LIx = 0 （AI3 的手动基准），则切换至速度调节，如果 LIx = 1 （自动）则切换至 PI 调节。



模拟输入口应用功能

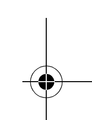
预置设定点：
2 或 4 个预置设定点，相应需要 1 或 2 个逻辑输入口：

<table>
<tr><td colspan="2">2 个预置设定点</td><td colspan="3">4 个预置设定点</td></tr>
<tr><td colspan="2">定义：LIx 给 Pr2</td><td colspan="3">定义：LIx 给 Pr2， LIy 给 Pr4</td></tr>
<tr><td>LIx</td><td>给定值</td><td>LIy</td><td>LIx</td><td>给定值</td></tr>
<tr><td>0</td><td>模拟给定</td><td>0</td><td>0</td><td>模拟给定</td></tr>
<tr><td>1</td><td>过程最大值 (= 10 V)</td><td>0</td><td>1</td><td>PI2 （可调）</td></tr>
<tr><td colspan="2" rowspan="2"></td><td>1</td><td>0</td><td>PI3 （可调）</td></tr>
<tr><td>1</td><td>1</td><td>过程最大值 (= 10 V)</td></tr>
</table>

力矩限幅：（只在带有模拟输入口 AI3 的 I/O 扩展板上使用）。
在 AI3 上加的信号以线性方式对内部力矩限幅进行调整 （“drive”传动菜单中的参数 TLI）：
- 若 AI3=0V：力矩限幅 = TLI × 0 = 0
- 若 AI3=10V：力矩限幅 = TLI。

应用：力矩或牵引力修正等。

编码器输入口应用功能

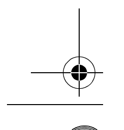
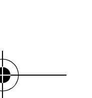
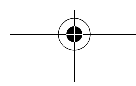
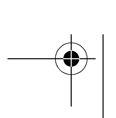
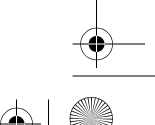


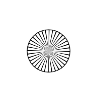
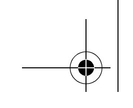
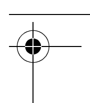
（使用带编码器输入的 I/O 扩展板）

速度调节：使用增量编码器或传感器进行速度校正。
（见与卡配供的文档）。

求和速度给定 ：从编码器输入口输入的设定点与 AI1 值求和。（参见扩展板所附文档）。

应用：
- 多个变频器速度同步。“驱动”菜单中的参数 PLS 用于调整电机之间的速度比。
- 使用编码器的设定点。


可配置 I/O 口的应用功能

逻辑输入口应用功能

继电器 R2，LO 固定状态输出 （带有 I/O 扩展板）。

输出接触器控制 （OCC）：可以定义给 R2 或 LO
允许变频器控制一个电流接触器 （在变频器与电机之间的） 。当发出运行命令时要求闭合接触器。当电机无电流时，断开接触器。

⚠ 如果设定了直流注入制动功能，则不应在停止模式下运行过长时间，因为接触器只在制动结束时才断开。

变频器运行中 （RUN 运行）：可以定义给 R2 或 LO
如果电机正由变频器供电 （有电流），或者在零给定值下有运行命令时，逻辑输出口置为 1 态。

达到频率门槛值 (FTA)：可以定义给 R2 或 LO
如果电机频率大于或等于调整菜单中 Ftd 设定的频率门槛值，逻辑输出口置为 1 态。

达到设定点 (SRA)：可以定义给 R2 或 LO
如果电机频率等于设定点值，逻辑输出口置为 1 态。

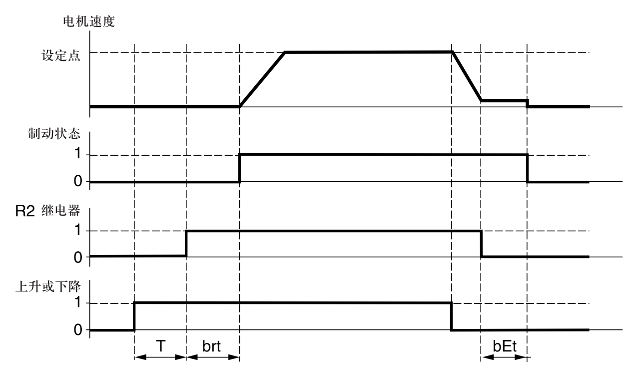
达到最高速度 (FLA)：可以定义给 R2 或 LO
如果电机频率等于 HSP，逻辑输出口置为 1 态。

电流达到门槛值 (CTA)：可以定义给 R2 或 LO
如果电机电流大于或等于调整菜单中 Ctd 设定的门槛值，逻辑输出口置为 1 态。

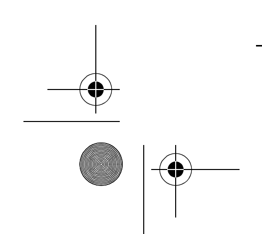
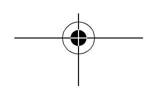
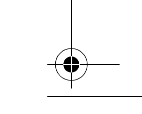
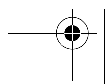
电机达到热状态 (TSA)：可以定义给 R2 或 LO
如果电机温度大于或等于调整菜单中 ttd 设定的门槛值，逻辑输出口置为 1 态。

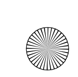
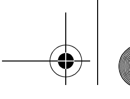
变频器达到热状态 (TAD)：可以定义给 R2 或 LO
如果变频器温度大于或等于调整菜单中 dtd 设定的门槛值，逻辑输出口置为 1 态。

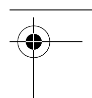
制动顺序 (BLC) ：只能定义给继电器 R2
用于由变频器控制电机进行电磁制动，例如垂直提升应用。对于水平移动的制动，应使用 “drive running” （变频器运行）功能。



T = 不可调整的延时时间
调整菜单中可读取的设置：
- 制动释放频率 (brL)
- 制动释放延时 (brt)
- 制动开始频率 (bEt)
- 制动释放电流 (Ibn)
- 制动开始频率 (bEn)



对于垂直提升应用，推荐的制动控制设置：

1 制动释放频率 (brL)：

将制动释放频率设置为额定偏移率与以 Hz 为单位的额定频率的乘积 (g x FS)。

计算方法： $slip = \frac{(Ns - Nr)}{Ns}$

Ns 为同步速度，单位为 rpm。
（对于 50 Hz 电源：极对数为 1 的电机 Ns = 3000 rpm，极对数为 2 的电机为 1500 rpm，极对数为 3 的电机为 1000 rpm 极对数为 4 的电机为 750 rpm ；
对于 60 Hz 电源：极对数为 1 的电机 Ns = 3600 rpm，极对数为 2 的电机为 1800 rpm，极对数为 3 的电机为 1200 rpm 极对数为 4 的电机为 900 rpm）。
- Nr 为额定力矩下的额定速度，单位为 rpm，使用电机铭牌上给出的速度。释放频率 = g x Fs。
- g 为上面所计算出的偏移率
- Fs 为电机额定频率 （在电机铭牌上给出）
举例：电机极对数为 2，铭牌上标示 1430 rpm， 50 Hz 电源
g = (1500 - 1430) / 1500 = 0.0466
制动释放频率 = 0.0466 x 50 = 2.4 Hz

2 制动释放电流 (Ibr)：
将制动释放电流调至电机上标明的额定电流值。
注意对于 1 点和 2 点：所指示的值 （释放电流和释放频率）对应于理论值。如果在测试中使用这些理论值时力矩不足，应将制动释放电流保持为电机额定电流，降低制动释放频率 （直至额定偏移的 2/3）。如果结果仍不能满意，则应返回理论值，再增加制动释放电流 （最大值由变频器强加）并逐渐增大制动释放频率。

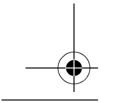
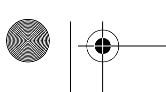
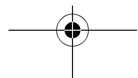
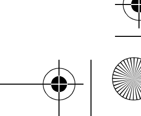
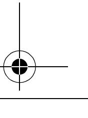
3 加速时间：
对于提升应用，将加速斜坡定为 >0.5s 是较明智的。应保证变频器加速电流不会超过电流限幅值。
对于减速的要求亦是如此。
注意：对于提升应用，应使用制动电阻。应保证所选择的配置和设定不会导致提升负载的失控和跌落。

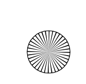
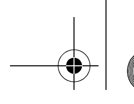
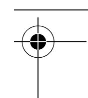
4 制动释放延时 (brt)：
根据制动类型来调整。这是打开机械抱闸所需的时间。

5 制动开始频率 (bEn)：
先设为额定滑差频率的 2 倍 （例如举例的 2 x 2.4 = 4.8 Hz）。然后根据结果调整。

6 制动开始延时 (bEt)：
根据制动类型调整。这是机械抱闸制动所需的时间。

4-20 mA 信号丢失 (APL) （4-20 mA 信号丢失），可被定义到 R2 或 L0
如果 4-20 mA 输入端上的信号低于 2 mA，则此逻辑输出被设为 1。

AO 和 AO1 模拟输出应用功能

模拟输出 AO 和 AO1 是 AOL(mA) 和 AOH(mA) 的输出电流。
- AOL 和 AOH 可从 0 到 20 mA 配置。

举例 AOL - AOH： 0 - 20 mA
4 - 20 mA
20 - 4 mA

电机电流 （代码 OCR）：表征电机均方根电流。
- AOH 对应于变频器额定电流的 2 倍。
- AOL 对应于零电流。

电机频率 （代码 OFR）：变频器估测的电机频率。
- AOH 对应于最大频率 （参数 tFr）。
- AOL 对应于零频率。

斜坡输出 （代码 ORP）：表征斜坡输出频率。
- AOH 对应于最大频率 （参数 tFr）。
- AOL 对应于零频率。

电机力矩 （代码 TRQ）：表征电机力矩的绝对值。
- AOH 对应于电机额定力矩的 2 倍。
- AOL 对应于零力矩。

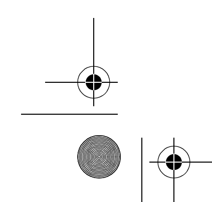
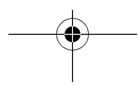
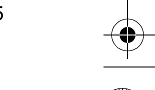
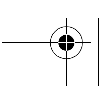
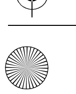
带符号电机力矩 （代码 STQ）：表征电机力矩及其方向：
- AOL 对应于制动力矩 = 2 倍额定力矩
- AOH 对应于电机力矩 = 2 倍额定力矩
- $\frac{AOH + AOL}{2}$ 对应于零力矩。

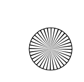
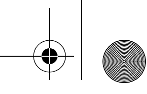
带符号斜坡 （代码 ORS）：表征斜坡输出频率及其方向：
- AOL 对应于反转最大频率 （参数 tFr）。
- AOH 对应于正转最大频率 （参数 tFr）。
- $\frac{AOH + AOL}{2}$ 对应于零频率。

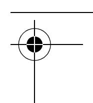
PI 设定点 （代码 OPS）：表征 PI 调节器设定点
- AOL 对应于最小设定值。
- AOH 对应于最大设定值。

PI 反馈 （代码 OPF）：表征 PI 调节器反馈值
- AOL 对应于最小反馈值。
- AOH 对应于最大反馈值。

PI 误差（代码 OPE）：表征 PI 调节器误差值，它是传感器反馈范围的百分数（最大反馈值－最小反馈值）。
- AOL 对应于最大误差 < 0
- AOH 对应于最大误差 > 0
- $\frac{AOH + AOL}{2}$ 对应于零误差 (OPE = 0)



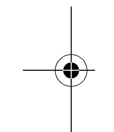
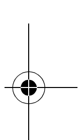
可配置 I/O 口的应用功能

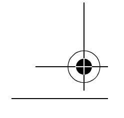
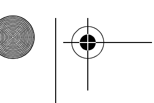
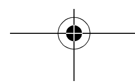
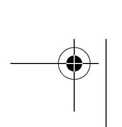
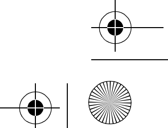
PI 积分 （代码 OPI）：表征 PI 调节器误差值积分。
- AOL 对应于一个零积分。
- AOH 对应于一个饱和积分。

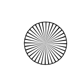
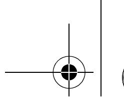
电机功率 （代码 OPR）：电机所吸收功率的镜像。
- AOL 对应于电机额定功率的 0 %。
- AOL 对应于电机额定功率的 200 %。

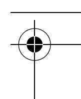
电机热状态 （代码 THD）：计算得出的电机热功率的镜像。
- AOL 对应于 0 %。
- AOH 对应于 200 %。

变频器热状态 （代码 THD）：变频器热功率的镜像。
- AOL 对应于 0 %。
- AOH 对应于 200 %。

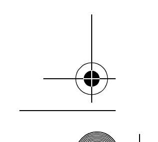
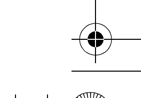
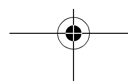
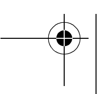
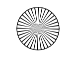



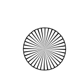
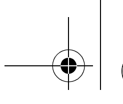
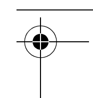


故障菜单

开关在 位置时，可以读取该菜单。
只有在变频器锁定的停止模式下才能进行修改。

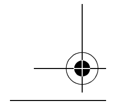
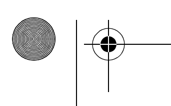
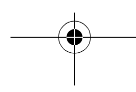
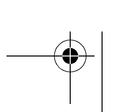
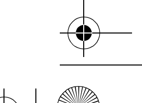
代码	说明	出厂设置
Atr	Auto Restart	No
	此功能用于故障消失后，让变频器自动重新起动 （选择 Yes/No）。下列故障消除后允许自动重新起动： - 电源过压 - DC 总线电压过压 - 外部故障 - 电机缺相 - 串行口故障 - 通信故障 - 4-20 mA 给定丢失 - 电机过载 （条件：热状态低于 100%） 变频器过热 （条件：变频器热状态低于 70%） - 电机过热 （条件：传感器阻值低于 1500 Ω） 当此功能激活时，出现以下一个或多个故障后， R1 继电器保持闭合：变频器每 30 s 尝试起动一次。变频器最多可尝试 6 次，失败之后不能再自动起动 （故障出现）。失败 6 次后，变频器保持最后的锁定状态，故障继电器释放，只有断电才能进行复位。 ⚠ 此功能需要保持相关顺序。**应保证以外的重新起动不会对设备和人员带来危险。**	
rSt	Reset Type	RSP
	如果已将一个逻辑输入口定义为故障复位，则该功能可以读取。 2 种选择方式：部分复位 (RSP)，总复位 (RSG)。 可部分复位 (rSt = RSP) 的故障有： - 电源过压 - 电机过热 - 电机过载 - 电机缺相 - 串行连接故障 - 通信故障 - DC 直流总线过压 - 4-20mA 信号丢失 - 全面检修 - 变频器过热 - 外部故障 - 超速 对所有故障都可以进行总复位 (rSt=RSG)。总复位实际上禁止了所有故障 （强行操作）。 设置 rSt = RSG： 1 显示 RSG。 2 按 “ENT”键。 3 变频器显示 “See manual”（参见手册）。 4 按 ▲ 然后按 ▼，然后按 “ENT”键。	
OPL	OutPhaseLoss	Yes
	允许电机缺相故障。 （如果电机和变频器之间用一个隔离器，此功能无效）。 选择 Yes 或 No。	
IPL	InPhseLoss	Yes
	允许电源缺相故障。 （如果是通过直流母线直接供电或一个单相电源供至一台 ATV58 • U72M、 U90M2、D12M2，此功能无效。） 选择 Yes 或 No。 此故障在 ATV58 • U09M2、U18M2、U29M2 和 U41M 不会出现。	

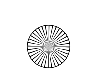
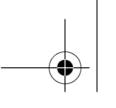
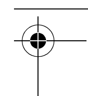






故障菜单

代码	说明	出厂设置
tHt	ThermProType	ACL
	定义由变频器提供的间接电机热保护的类型。如果变频器连接了 PTC 传感器，该功能无效。 无热保护：NO：无保护。 自冷却电机 (ACL)：变频器考虑转动频率所造成的降容。 强制冷却电机 (FCL)：变频器不考虑旋转频率所造成的降容。	
LFL	LossFollower	No
	允许 4-20 mA 给定信号丢失故障。 只有当 AI2 给定参数 （CrL 和 CrH）的最小 / 最大值都大于 3 mA 时才能设置此功能，或如果 CrL>CrH, - No：无故障。 - Yes：直接的故障。 - STT：根据参数 STT 停机，在信号返回时没有故障重起动。 - LSF：根据参数 STT 停机，变频器在停机后显示一个故障。 - LFF：强制速度为 LFF 所设置的值。 - RLS：当 4-20mA 无故障消失时保持所达到的速度，在信号返回时重起动。	
LFF	Flt. Speed 4-20	0
	在丢失 4-20mA 信号时使用低效运行速度。可在 0 到 HSP 间调整。	
FLr	Catch On Fly	No
	当下面情况发生后，允许重新平滑起动： - 电源掉电或简单断电 - 故障复位或自动重新起动。 - 逻辑输入控制的自由停车或直流制动停车。 - 变频器输出失控。 选择 Yes/No。 若继电器 R2 指定为制动顺序功能，参数 FLr 保持锁定在 No 状态。	
StP	Cont. Stop	No
	电源缺相时受控停车。此功能只有在参数 IPL 设为 No 时才能工作。若 IPL 设为 Yes， StP 则设为 No。可用选项有： **No**：电源缺相时锁定 MMS：保持直流母线供电：有惯性储存的能量维持变频器控制所需的电压，直至出现 **USF** （欠压）故障 FRP：斜坡停车：按照设定的减速斜坡 dEC 或 dE2 减速直到停止或出现 USF （欠压）故障。 在 ATV58•U09M2、 U18M2、 U29M2 和 U41M2 上无此操作。	
Sdd	RampNotFoll	Yes
	如果通过测速发电机或脉冲发电机给出的反馈已经过编程，则此功能可以使用。当此功能有效时，如果检测到速度误差 （定子频率与测得的速度之间的差别），变频器就被锁定。选择 Yes/No。	
EPL	External fault	Yes
	定义出现外部故障时的停机类型： - Yes：立即故障 - LSF Stop+flt：根据 Stt 参数停机，在停机结束时故障	

文件菜单

开关在 □ 位置时，可以读取本菜单。
只有在变频器锁定的停车状态下才能进行此操作。

显示模块用于存储包含变频器配置的 4 个文件。

代码	说明	出厂设置
F1S F2S F3S F4S	File 1 State File 2 State File 3 State File 4 State	FRE FRE FRE FRE
	用于显示相应文件的状态。 可能的状态： **FRE**：文件释放 （显示模块交付状态） **EnG**：一个配置信息已存入该文件	
FOt	Operat.Type	NO
	用于选择对文件进行的操作。 可能的操作： **NO**：没有操作请求 （显示模块与变频器刚连接时的默认值） **STR**：将变频器配置存入显示模块的某个文件中 **REC**：将一个文件的内容传给变频器 **Ini**：将变频器恢复为出厂设置 ⚠ **恢复出厂设置会把您所做的配置和设置全部清除。**	

操作方法：

选择 STR、 REC 或 InI 并按 “ENT”键。

1 若 Operation = STR：
文件号将显示出来。用 ▲ 或 ▼ 键选择一个文件，按 “ENT”确认。

2 若 Operation = REC：
文件号将显示出来。用 ▲ 或 ▼ 键选择一个文件，按 “ENT”确认。

- 显示屏显示： CHG 接线正确吗? 确认

检查接线是否与文件中的配置相符。
用 “ESC”取消或 “ENT”确认。
- 随后显示要求用 “ENT”或 “ESC”进行第二次确认或取消。

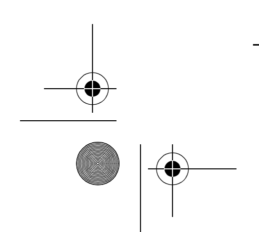
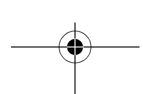
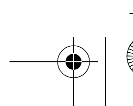
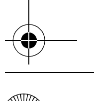
3 若 Operation = InI：
用 “ENT”确认

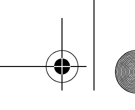
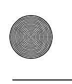
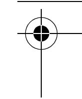
- 显示屏显示： CHG 接线正确吗? 确认

检查接线是否与出厂配置相符。
用 “ESC”取消或 “ENT”确认。
- 随后显示要求用 “ENT”或 “ESC”进行第二次确认或取消。

每次操作结束时显示参数 “Operation”已设回 “NO”的状态。



文件菜单



文件菜单 （继续）

代码	说明
COd	Password
	密码

变频器配置可以由密码保护 (COd)。

注意：该参数被用作一种提示。它可以预防读取所有参数。对该参数进行的任何修改都必须特别谨慎并保存好。

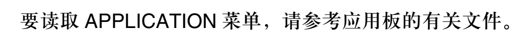
代码值由 4 位数字组成，最后一位由用户要求确定可进入的级别。



根据显示模块背面进入锁定开关的位置以及口令码的权限来读取菜单。
口令码为 0000 （出厂设置）不限制读取菜单。

下表定义了根据口令码的最后一位数字所能进入的菜单。

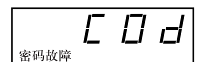
	口令码最后一位		
菜单	拒绝进入	显示	修改
调整	0 和 9 0000 除外	1	2
2 级： 调整，宏 - 配置，传动，控制， I/O，故障，文件 （除口令码外），通信 （若装有通信板）	0 和 9 0000 除外	3	4
应用 （若装有应用板）	0 和 9 0000 除外	5	6
2 级和应用 （若装有应用板）	0 和 9 0000 除外	7	8



要读取 APPLICATION 菜单，请参考应用板的有关文件。

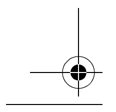
用 ▲ 和 ▼ 键修改口令码。

若输入了一个错误的口令码，会被拒绝并显示下面信息：

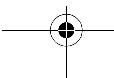
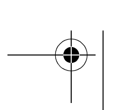
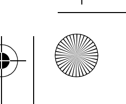


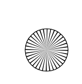
按下键盘上的 ENT 或 ESC 键后，密码参数显示变为：0000，读取参数级别不变。此操作须重复进行。

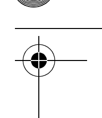
要读取密码保护的菜单，用户必须先在文件菜单中输入该密码。







通信和应用菜单 / 运行帮助 / 维护

通信菜单

只有安装了通信板这个菜单才能显示出来。开关在 位置时可读取本菜单。只有在变频器锁定的停止模式下才能进行配置。

关于通信选项板的使用，请参考随板提供的文件。

关于经过 RS485 模块进行通信的问题，请参考与 RS485 连接组件一起提供的文件。

应用菜单

该菜单只有在安装了 “用户应用” 板时才能显示。开关在 位置时可以读取本菜单。只有在变频器锁定的停止模式下才能进行配置。**请参考随板提供的文件。**

运行帮助

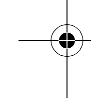
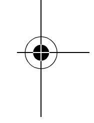
参见 “简介” 一节中对指示灯的介绍。

维护



对变频器进行维护前要断掉电源并等待电容放电完毕（大约 3 分钟）：变频器前面板上的绿色 LED 灯熄灭。

注意：+、 - 或 PA、 PB 端子上的直流电压可以高达 900V，它取决于进线电压。

如果在安装或运行过程中出现问题，应先确认环境、安装和连接等因素是否符合推荐的要求。**参见 Altivar** 用户手册。

维护

Altivar 58 变频器不需要任何预防性维护。但建议用户定期作以下检查：
- 查看连接是否牢固
- 确保设备的环境温度符合要求，通风良好 （风机的平均寿命为 3-5 年，与运行情况有关）
- 给变频器除尘

维护帮助

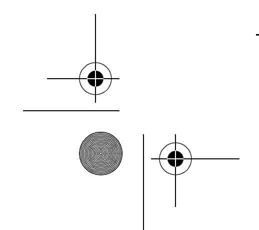
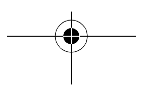
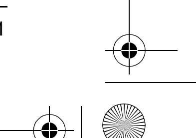
检测到的第一个故障会被记录并显示在屏幕上：变频器锁定，红色 LED 灯亮，故障继电器 R1 脱扣。

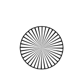
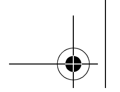
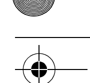
消除故障

在发生不可复位的故障时，先断开变频器的电源。
找出故障原因，将其消除。
重新接通电源：如果故障已排除，则故障现象就会清除。

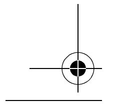
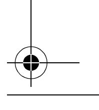
如果编程设置了自动重新起动功能，则在一些情况下，设备在故障消除之后就会自动重新起动。

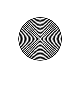
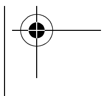
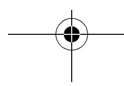
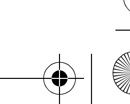


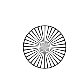
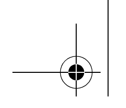
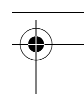





故障显示	可能原因	解决步骤或办法
PHF Mains Phase Loss	• 变频器供电电源不对或熔断器熔断。 • 某相有瞬时故障 • 在 ATV58•U72M2、U90M2 或 D12M2（三相）的单相电源上使用。	• 检查电源连接和熔断器 • 复位 • 在 FAULT 菜单中将 “In Phase Loss”（In 相丢失）（代码 IPL）故障配置为 “No”
USF Undervoltage	• 电源电压欠压 • 电压瞬时跌落 • 负载电阻损坏	• 检查电源电压 • 更换负载电阻
OSF Overvoltage	• 电源电压过高	• 检查电源电压
OHF Drive Overheat	• 散热器温度过高 (tHd>118 %)	• 监测电机负载、变频器通风，等变频器冷却后再复位
OLF Mot Overload	• 由于过载时间过长引起热保护跳闸 (tHr>118 %)	• 检查热保护设置，监测电机负载 • 约等 7 分钟之后再重新起动
ObF Overbraking	• 制动过快或负载过重 • 运行中电源过电压	• 延长减速时间，如有必要，增加制动电阻 • 检查可能的电源过电压
OPF Motor Phase Loss	• 变频器输出的某相开路	• 检查电机连线和输出接触器的动作（如果安装） • 如果在宏配置中使用了电机起动器，则应检查继电器 R2 和输出接触器的配置。
LFF Loss Follower	• AI2 口的 4-20 mA 信号丢失	• 检查设定电路的连接
OCF Overcurrent	• 斜坡过短 • 惯性过大或负载过重 • 机械卡位	• 检查设置 • 检查电机 / 变频器 / 负载的容量 • 检查机械部分状态
SCF Short Circuit	• 变频器输出端短路或接地	• 断开变频器，检查连接电缆。检查半导体电桥
CrF Precharge Fault	• 负载继电器控制故障 • 负载电阻损坏	• 检查变频器中的接头以及负载电阻
SLF Serial Link Flt	• 变频器接口连接不正确	• 检查变频器接口连接情况
OtF Motor Overheat	• 电机过热 （PTC 传感器）	• 检查电机通风以及周围环境温度，监测电机负载 • 检查使用探头的类型
tSF PTC Therm Sensor	• 传感器与变频器连接错误	• 检查传感器与变频器之间的连接 • 检查探头

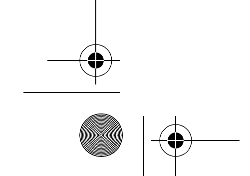
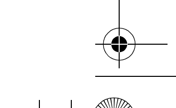
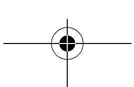
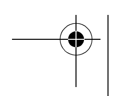
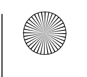



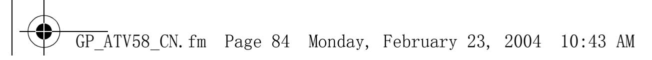
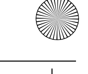
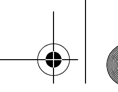
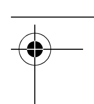





维护

故障显示	可能原因	解决步骤或办法
EEF EEProm Fault	• EEPROM 存储错误	• 切断变频器电源并复位
InF Internal Fault	• 内部故障 • 接口故障	• 检查变频器的接口
EPF External Fault	• 由外部设备引起的故障	• 检查引起故障的设备并复位
SPF Sp. Feedbk. Loss	• 无速度反馈	• 检查速度传感器的连接和机械耦合
AnF Load Veer. Flt	• 不跟随斜坡 速度反向到设定点	• 检查速度反馈设置和连线 • 检查对特定负载的设置是否合适 • 检查电机 - 变频器的容量，以及是否需要制动电阻
SOF Overspeed	• 不稳定 负载过重	• 检查设置和参数 增加制动电阻 • 检查电机 / 变频器 / 负载的容量
CnF Network Fault	• 现场总线中的通信故障	• 检查变频器的网络连接 • 检查超时
ILF Int. Comm. Flt	• 选项板与控制板间的通信故障	• 检查选项板与控制板之间的连接
CFF Rating Fault-ENT Option Fault-ENT Opt. Missing-ENT CKS Fault - ENT	更换板后可能引起的错误： • 电源板的标称改变 • 选项板型号改变，或是在原来没有选项板而宏 - 配置是 CUS 的情况下安装选项板 • 选项板拆除 • 保存了不一致的配置 按 ENT 键时，会出现下列信息： Fact.Set? ENT/ESC（恢复出厂设置吗？ENT/ESC）	• 检查变频器硬件配置 （电源板或其他） • 切断变频器电源并复位 • 将配置存储在显示模块中的一个文件中 • 按 ENT 键，恢复出厂设置。
CFI Config. Fault	• 经串行口送入变频器的配置不一致	• 检查以前送入的配置 • 发送一个一致的配置

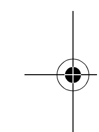
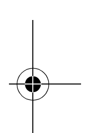
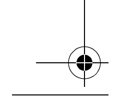
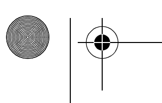
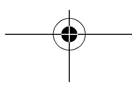
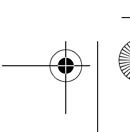
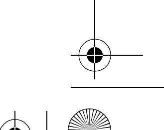






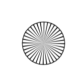
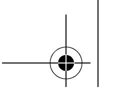





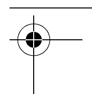

维护

无故障显示的故障

故障显示	可能原因	解决步骤或办法
无代码显示， LED 不亮	• 无电源	• 检查变频器电源
无代码显示，绿色 LED 亮，红色 LED 状态不定	• 显示模块有缺陷	• 更换显示模块
rdY 绿色 LED 亮	• 在线控模式下变频器安装了通信板或 RS485 接口组件 • 给 “自由停车”或 “快速停车”分配了一个 LI 输入口。而其控制信号丢失。	• 将参数 LI4 设为强制本机控制模式，然后使用 LI4 对其进行确认。 • 将输入口接在 20V 电压上，禁止制动。



保存配置和设置

变频器型号 ATV58............ 显示器 rEF：........................
用户识别号 （如果贴有）：
选项板：无 ☐ 有 ☐ ：型号 ....

口令码：无 ☐ 有 ☐ ：..
显示模块上的配置文件号：...............
宏－配置：...

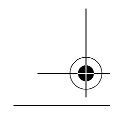
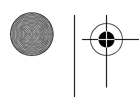
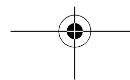
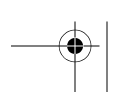
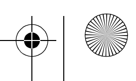
对于 CUS：用户自定义 配置，定义的 I/O 口如下：

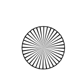
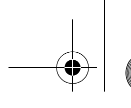
	ALTIVAR	选项板
逻辑输入口	LI 1 : LI 2 : LI 3 : LI 4 :	LI 5 : LI 6 :
模拟输入口	AI 1 : AI 2 :	AI 3 :
编码器输入口		AI3 :
继电器	R2 :	
逻辑输出口		LO :
模拟输出口	AO1 :	AO :

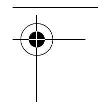
参数整定：

代码	出厂设置	用户设置 (1)	代码	出厂设置	用户设置 (1)
ACC	3 s	s	SP7	35 Hz	Hz
dEC	3 s	s	JOG	10 Hz	Hz
LSP	0 Hz	Hz	JGt	0,5 s	s
HSP	50 / 60 Hz	Hz	brL	0 Hz	Hz
FLG	20 %	%	Ibr	0 A	A
StA	20 %	%	brt	0 s	s
ItH	根据型号	A	bEn	0 Hz	Hz
IdC	根据型号	A	bEt	0 s	s
tdC	0.5 s	s	FFt	50/60 Hz	Hz
SdC	0.5 ItH	A	bIP	no	
AC2	5 s	s	rPG	1	
dE2	5 s	s	rIG	1 / s	/ s
JPF	0 Hz	Hz	FbS	1	
JF2	0 Hz	Hz	PIC	no	
JF3	0 Hz	Hz	dtS	1	
tLS	0	s	Ctd	1.36 In	A
USC	1		ttd	100 %	%
UFr	100 %	%	tL2	200%	%
SLP	100 %	%	PSP	0 s	s
PFL	20 %	%	PI2	30 %	%
SP2	10 Hz	Hz	PI3	60 %	%
SP3	15 Hz	Hz	dtd	105 %	%
SP4	20 Hz	Hz	Ftd	50/60 Hz	Hz
SP5	25 Hz	Hz	F2d	50/60 Hz	Hz
SP6	30 Hz	Hz			

(1) 无此参数时，空白不填。




保存配置和设置

传动菜单参数：

代码	出厂设置	用户设置 (1)	代码	出厂设置	用户设置 (1)
UnS	根据型号	V	rPt	LIN	Hz
FrS	50 / 60 Hz	Hz	dCF	4	
nCr	根据型号	A	tLI	200%	%
nSP	根据型号	rpm	CLI	1.36 In	A
COS	根据型号		AdC	yes	
tUn	no		PCC	1	
tFr	60 / 72 Hz	Hz	SFt	LF	
nLd	no		SFr	根据型号	kHz
Fdb	no		nrd	是	
brA	no		SPC	否	
Frt	0 Hz		PGt	DET	
Stt	STN		PLS	1024	

(1) 无此参数时，空白不填。

控制菜单参数

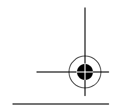
代码	出厂设置	用户设置 (1)	代码	出厂设置	用户设置 (1)
tCC	2 W		AOH	20 mA	mA
tCt	LEL		Str	否	
rIn	否		LCC	否	
bSP	否		PSt	是	
CrL	4 mA	mA	Add	0	
CrH	20 mA	mA	tbr	19200	
AOL	0 mA	mA	rPr	no	

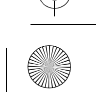
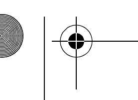
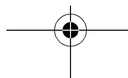
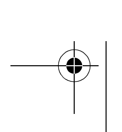
(1) 无此参数时，空白不填。

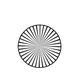
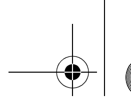
故障菜单参数：

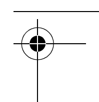
代码	出厂设置	用户设置 (1)	代码	出厂设置	用户设置 (1)
Atr	否		LFF	0 Hz	Hz
rSt	RSP		FLr	否	
OPL	是		StP	否	
IPL	是		Sdd	是	
tHt	ACL		EPL	是	
LFL	否				

(1) 无此参数时，空白不填。







语言菜单

名称	代码
English	LnG
Français	LnG
Deutsch	LnG
Español	LnG
Italiano	LnG

宏配置菜单

名称	代码
Hdg : Handling	CFG
GEn : General Use	CFG
VT : Var. Torque	CFG

1 - 显示菜单

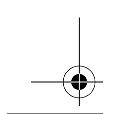
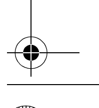
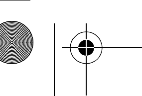
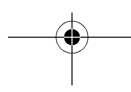
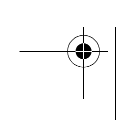
名称	代码
Var. State	- - -
Freq. Ref.	FrH
Output Freq.	rFr
Motor Speed	SPd
MotorCurrent	LCr
Machine Spd.	USP
Output Power	OPr
MainsVoltage	ULn
MotorThermal	tHr
DriveThermal	tHd
Last Fault	LFt
Freq. Ref.	LFr
Consumption	APH
Run time	rtH

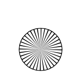
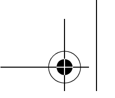
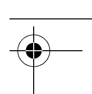
2 - 调整菜单

名称	代码
Freq. Ref. - Hz	LFr
Acceleration - s	ACC
Deceleration - s	dEC
Accelerate 2 - s	AC2
Decelerate 2 - s	dE2
Low Speed - Hz	LSP
High Speed - Hz	HSP
Gain - %	FLG
Stability - %	StA

2 - 调整菜单 （续）

名称	代码
ThermCurrent - A	ItH
DC Inj.Curr. - A	IdC
DC Inj. Time - s	tdC
DC Stop Curr.- A	SdC
Jump Freq. - Hz	JPF
Jump Freq.2 - Hz	JF2
Jump Freq.3 - Hz	JF3
Machine Coef.	USC
LSP Time - s	tLS
IR Compens. - %	UFr
Slip Comp. - %	SLP
Preset Sp.2 - Hz	SP2
Preset Sp.3 - Hz	SP3
Preset Sp.4 - Hz	SP4
Preset Sp.5 - Hz	SP5
Preset Sp.6 - Hz	SP6
Preset Sp.7 - Hz	SP7
Curr.Lev.Att - A	Ctd
Jog Freq. - Hz	JOG
JOG Delay - s	JGt
Trq.Limit 2 - %	tL2
V/f Profile - %	PFL
PI Prop. Gain	rPG
PI Int. Gain - /s	rIG
PI Coeff.	FbS
PI Inversion	PIC
BrReleaseLev - Hz	brL
BrRelease I - A	Ibr
BrReleasTime - s	brt
BrEngage Lev - Hz	bEn
BrEngageTime - s	bEt
Trip Thresh NST-Hz	FFt
Brake impul.	bIP
Tacho Coeff.	dtS
Freq.Lev.Att - Hz	Ftd
Freq.Lev.2 - Hz	F2d
ThermLev.Att - %	ttd
PI Filter - s	PSP
PI Preset 2 - %	PI2
PI Preset 3 - %	PI3
ATV Th. fault	dtd


菜单汇总表

3 －传动菜单

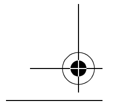
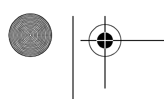
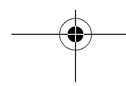
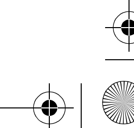
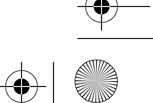
名称	代码
Nom.Mot.Volt - V	UnS
Nom.Mot.Freq - Hz	FrS
Nom.Mot.Curr - A	nCr
Nom.MotSpeed -rpm	nSP
Mot. Cos Phi	COS
Auto Tuning	tUn
Max. Freq. - Hz	tFr
Energy Eco	nLd
I lim Adapt.	Fdb
DecRampAdapt	brA
SwitchRamp2 - Hz	Frt
Type of stop	Stt
Ramp Type	rPt
DECRampCoeff	dCF
Trq.Limit - %	tLI
Int. I Lim - A	CLI
Auto DC Inj.	AdC
Motor P Coef	PCC
Sw Freq. Type	SFt
Sw Freq -kHz	SFr
Noise Reduct	nrd
Sp'l Motor	SPC
PG Type	PGt
Num. Pulses	PLS

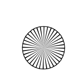
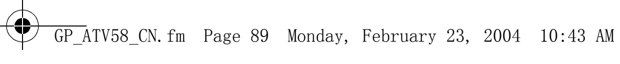
4 - 控制菜单

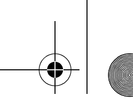
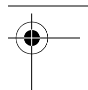
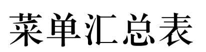
名称	代码
TermStripCon	tCC
Type 2 Wire	tCt
RV Inhibit.	rIn
deadb./pedst	bSP
AI2 min Ref. - mA	CrL
AI2 Max Ref - mA	CrH
Min Val. AO - mA	AOL
Max Val. AO - mA	AOH
Save Ref.	Str
Keypad Comm.	LCC
Stop Priorit	PSt
DriveAddress	Add
BdRate RS485	tbr
Reset counters	rPr

5 - I/O 菜单

名称	代码
LI2 Assign.	LI2
LI3 Assign.	LI3
LI4 Assign.	LI4
LI5 Assign.	LI5
LI6 Assign.	LI6
NO :Not assigned	
RV :Reverse	
RP2:Switch ramp2	
JOG:JOG	
+SP: + Speed	
-SP: - Speed	
PS2: 2 preset SP	
PS4: 4 preset SP	
PS8: 8 preset SP	
RFC:Auto/manu	
NST:Freewhl Stop	
DCI:DC inject.	
FST:Fast stop	
CHP:Multi. Motor	
TL2:Trq.Limit 2	
FLO:Forced Local	
RST:Fault Reset	
ATN:Auto-tune	
PAU:PI Auto/Manu	
PR2:PI 2 Preset	
PR4:PI 4 Preset	
TLA:Torque limit	
EDD:Ext flt.	
R2 Assign.	r2
LO Assign.	LO
NO:Not assigned	
RUN:DriveRunning	
OCC:OutputCont.	
FTA:Freq Attain.	
FLA:HSP Attained	
CTA:I Attained	
SRA:FRH Attained	
TSA:MtrTherm Lvl	
BLC:Brk Logic	
APL:4-20 mA loss	
F2A:F2 Attained	
TAD:Alarm.th.var.	

菜单汇总表

5 - I/O 菜单 （续）

名称	代码
AI2 Assign.	AI2
AI3 Assign.	AI3
NO:Not assigned FR2:Speed Ref2 SAI:Summed Ref. PIF:PI regulator PIM:PI Man.ref. SFB:Tacho feedbk PTC:Therm.Sensor ATL:Torque limit	
AI3Assign(encoder)	AI3
NO:Not assigned SAI:Summed ref. RGI:PG feedbk	
AO Assign.	AO
NO:Not assigned OCR:Motor Curr. OFR:Motor Freq. ORP:Ramp Output TRQ:Motor torque STQ:Signed torque ORS:Signed ramp OPS:PI ref. OPF:PI Feedback OPE:PI Error OPI:PI Integral OPR:Motor power tHR:Motor Thermal tHD:Drive Thermal	

6 - 故障菜单

名称	代码
Auto Restart	Atr
Reset Type	rSt
OutPhaseLoss	OPL
InPhaseLoss	IPL
ThermProType	tHt
LossFollower	LFL
Flt. Speed 4-20	LFF
Catch On Fly	FLr
Cont. Stop	StP
RampNotFoll	Sdd
External fault	EPL

7 - 文件菜单

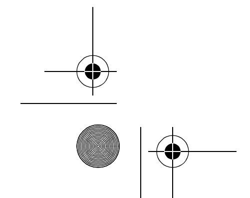
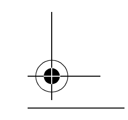
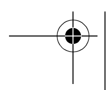
名称	代码
File 1 State	F1S
File 2 State	F2S
File 3 State	F3S
File 4 State	F4S
Operat.Type	FOt
Conf. Code	COd

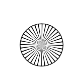
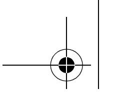
8 - 通信菜单

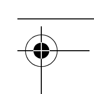
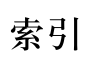
参见与通信板一同提供的文件。

9 - 应用菜单

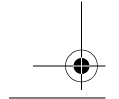
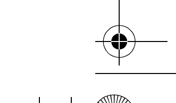
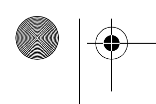
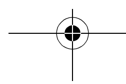
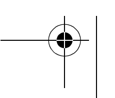
参见与通信板一同提供的文件。

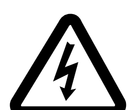




索引



IT NEUTRAL POINT CONNECTION : In the event of use on a 3-phase network with a voltage greater than 480V ±10 % with an isolated or high-impedance system (IT), the internal EMC filter capacitors which are connected to ground must be disconnected. Consult Schneider product support who are the only people qualified to perform this operation.

ATTENTION

When the speed controller is powered up, the power components and some of the control components are connected to the line supply. *It is extremely dangerous to touch them. The speed controller cover must be kept closed.*

After the ALTIVAR has been switched off and the green LED has gone out, *wait for 3 minutes before working on the equipment*. This is the time required for the capacitors to discharge.

The motor can be stopped during operation by inhibiting start commands or the speed reference while the speed controller remains powered up. If personnel safety requires prevention of sudden restarts, this electronic locking system is not sufficient : *fit a cut-off on the power circuit.*

ATTENTION

The speed controller is fitted with safety devices which, in the event of a fault, can shut down the speed controller and consequently the motor. The motor itself may be stopped by a mechanical blockage. Finally, voltage variations, especially line supply failures, can also cause shutdowns.

If the cause of the shutdown disappears, there is a risk of restarting which may endanger certain machines or installations, especially those which must conform to safety regulations.

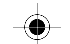
In this case the user must take precautions against the possibility of restarts, in particular by using a low speed detector to cut off power to the speed controller if the motor performs an unprogrammed shutdown.

The design of equipment must conform to the requirements of IEC standards.

In general, *the speed controller power supply must be disconnected* before any operation on either the electrical or mechanical parts of the installation or machine.

The products and equipment described in this document may be changed or modified at any time, either from a technical point of view or in the way they are operated. Their description can in no way be considered contractual.

NOTE



Contents



Warning

The Altivar 58 must be considered as a component : it is neither a machine nor a device ready for use in accordance with European directives (machinery directive and electromagnetic compatibility directive). It is the responsibility of the end user to ensure that the machine meets these standards.

The speed controller must be installed and set up in accordance with both international and national standards. Bringing the device into conformity is the responsibility of the systems integrator who must observe the EMC directive among others within the European Union.

The specifications contained in this document must be applied in order to comply with the essential requirements of the EMC directive.







Preliminary recommendations

Delivery

Check that the speed controller reference printed on the label is the same as that on the delivery note corresponding to the purchase order.

Remove the Altivar 58 from its packaging and check that it has not been damaged in transit.

Handling and storage

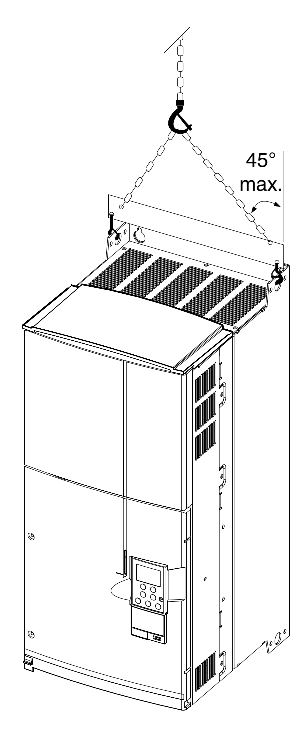
To ensure the speed controller is protected before installation, handle and store the device in its packaging.

Handling on installation

The Altivar 58 range comprises 7 sizes of device, with various weights and dimensions.

Small speed controllers can be removed from their packaging and installed without a handling device.

A hoist must be used with large speed controllers; for this reason they are supplied with handling "lugs". The precautions described below must be respected :



Selecting a Speed Controller with Heatsink and Built-in EMC Filters

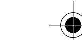
Line supply					Motor		Altivar 58				
Supply voltage (1) U1…U2	Line current (2) at U1	at U2	Max. prospective line Isc at U1	at U2	Power indicated on plate (3)		Nominal current	Max. transient current (4)	Power dissipated at nominal load (5)	Reference (6)	Weight

High torque applications (170% Tn)

V	A	A	kA	kA	kW	HP	A	A	W	Reference	kg
200…240	5.6	4.7	2	2	0.37	0.5	2.3	3.1	42	ATV-58HU09M2	2.2
50/60 Hz	9.8	8.3	2	2	0.75	1	4.1	5.6	64	ATV-58HU18M2	2.2
single-phase	18.5	15.6	5	5	1.5	2	7.8	10.6	107	ATV-58HU29M2	3.8
	24.8	21.1	5	5	2.2	3	11	15	145	ATV-58HU41M2	3.8
	24.7	21.3	5	5	3	–	13.7	18.6	220	ATV-58HU72M2(7)	6.9
	35	30	22	22	4	5	18.2	24.7	235	ATV-58HU90M2(7)	13
	46	39.4	22	22	5.5	7.5	24.2	32.9	310	ATV-58HD12M2(7)	13
200…240	9.7	8.3	5	5	1.5	2	7.8	10.6	107	ATV-58HU29M2	3.8
50/60 Hz	13.4	11.4	5	5	2.2	3	11	15	145	ATV-58HU41M2	3.8
3-phase	17.2	15	5	5	3	–	13.7	18.6	170	ATV-58HU54M2	6.9
	22.4	19.5	5	5	4	5	18.2	24.7	220	ATV-58HU72M2	6.9
	34.7	30	22	22	5.5	7.5	24.2	32.9	235	ATV-58HU90M2	13
	44.4	38.2	22	22	7.5	10	31	42.2	310	ATV-58HD12M2	13
380…500	3.4	2.6	5	5	0.75	1	2.3	3.1	55	ATV-58HU18N4	3.8
50/60 Hz	6	4.5	5	5	1.5	2	4.1	5.6	65	ATV-58HU29N4	3.8
3-phase	7.8	6	5	5	2.2	3	5.8	7.9	105	ATV-58HU41N4	3.8
	10.2	7.8	5	5	3	–	7.8	10.6	145	ATV-58HU54N4	6.9
	13	10.1	5	5	4	5	10.5	14.3	180	ATV-58HU72N4	6.9
	17	13.2	5	5	5.5	7.5	13	17.7	220	ATV-58HU90N4	6.9
	26.5	21	22	22	7.5	10	17.6	24	230	ATV-58HD12N4	13
	35.4	28	22	22	11	15	24.2	32.9	340	ATV-58HD16N4	13
	44.7	35.6	22	22	15	20	33	44.9	410	ATV-58HD23N4	15
	43	35	22	65	18.5	25	41	55	670	ATV-58HD28N4	34
	51	41	22	65	22	30	48	66	780	ATV-58HD33N4	34
	68	55	22	65	30	40	66	90	940	ATV-58HD46N4	34
	82	66	22	65	37	50	79	108	940	ATV-58HD54N4	57
	101	82	22	65	45	60	94	127	1100	ATV-58HD64N4	57
	121	98	22	65	55	75	116	157	1475	ATV-58HD79N4	57

Standard torque applications (120% Tn)

V	A	A	kA	kA	kW	HP	A	A	W	Reference	kg
380…500	51	41	22	65	22	30	44	55	750	ATV-58HD28N4	34
50/60 Hz	67	53	22	65	30	40	60	66	925	ATV-58HD33N4	34
3-phase	82	66	22	65	37	50	72	90	1040	ATV-58HD46N4	34
	99	79	22	65	45	60	85	108	1045	ATV-58HD54N4	57
	121	97	22	65	55	75	105	127	1265	ATV-58HD64N4	57
	160	130	22	65	75	100	138	157	1730	ATV-58HD79N4	57



(1) Nominal supply voltages : min. U1, max. U2.

(2) Typical value for a 4-pole motor with no additional choke except in single-phase for ATV-58PU72M2, U90M2 and D12M2 (7).

(3) These power levels are for a maximum switching frequency of 2 to 4 kHz, depending on the rating, and continuous operation. Switching frequencies are detailed in the section on "Technical Specifications".

Using the ATV-58 with a higher switching frequency :

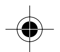
- For continuous operation derate by one power rating, for example :
  ATV-58PU09M2 for 0.25 kW – ATV-58PU18N4 for 0.37 kW – ATV-58PD12N4 for 5.5 kW.

- If no power derating is applied, do not exceed the following operating conditions :
  Cumulative running time 36 s maximum per 60 s cycle (load factor 60 %).

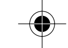
(4) For 60 seconds.

(5) These power levels are given for the maximum permissible switching frequency in continuous operation (2 or 4 kHz, depending on the rating).

(6) Speed controllers ordered under references ATV-58P●●●M2 and ATV-58P●●●N4 are supplied with a display module.
Speed controllers ordered under the same references ending in Z (ATV-58P●●●●●Z) are supplied without a display module.
The additional letter Z only appears on the packaging.



(7) • A line choke must be used if the speed controllers are to be connected to a single-phase line supply (see selection table in catalog).
⚠ • The "Supply phase loss" fault, code IPL, must be configured to "No" for these 3-phase speed controllers to operate on a single-phase supply. If this fault remains in its factory set-up (Yes), the speed controller will remain locked on a "PHF" fault.



Selecting a Speed Controller with Heatsink,without EMC Filters

Line supply					Motor		Altivar 58				
Supply voltage (1) U1…U2	Line current (2) at U1	at U2	Max. prospective line Isc at U1	at U2	Power indicated on plate (3)		Nominal current	Max. transient current (4)	Power dissipated at nominal load (5)	Reference (6)	Weight

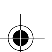
High torque applications (170% Tn)

V	A	A	kA	kA	kW	HP	A	A	W		kg
208…240 50/60 Hz 3-phase	43	40	10	22	11	15	47	64	745	ATV-58HD16M2X	34
	59	54	10	22	15	20	60	82	900	ATV-58HD23M2X	34
	71	64	10	22	18,5	25	75	102	895	ATV-58HD28M2X	57
	84	78	10	22	22	30	88	120	1030	ATV-58HD33M2X	57
	115	104	10	22	30	40	116	158	1315	ATV-58HD46M2X	57
380…500 50/60 Hz 3-phase	43	35	22	65	18,5	25	41	55	660	ATV-58HD28N4X	34
	51	41	22	65	22	30	48	66	775	ATV-58HD33N4X	34
	68	55	22	65	30	40	66	90	925	ATV-58HD46N4X	34
	82	66	22	65	37	50	79	108	930	ATV-58HD54N4X	57
	101	82	22	65	45	60	94	127	1085	ATV-58HD64N4X	57
	121	98	22	65	55	75	116	157	1455	ATV-58HD79N4X	57

Standard torque applications (120% Tn)

V	A	A	kA	kA	kW	HP	A	A	W		kg
208…240 50/60 Hz 3-phase	58	52	10	22	15	20	60	64	890	ATV-58HD16M2X	34
	70	63	10	22	18,5	25	75	82	980	ATV-58HD23M2X	34
	82	74	10	22	22	30	88	102	975	ATV-58HD28M2X	57
	114	102	10	22	30	40	116	120	1215	ATV-58HD33M2X	57
	141	125	10	22	37	50	143	158	1610	ATV-58HD46M2X	57
380…500 50/60 Hz 3-phase	51	41	22	65	22	30	44	55	735	ATV-58HD28N4X	34
	67	53	22	65	30	40	60	66	915	ATV-58HD33N4X	34
	82	66	22	65	37	50	72	90	1020	ATV-58HD46N4X	34
	99	79	22	65	45	60	85	108	1030	ATV-58HD54N4X	57
	121	97	22	65	55	75	105	127	1245	ATV-58HD64N4X	57
	160	130	22	65	75	100	138	157	1700	ATV-58HD79N4X	57





Selecting a Speed Controller with Heatsink, without EMC Filters

(1) Nominal supply voltages : min. U1, max. U2.

(2) These power levels are for the maximum permissible switching frequency for the speed controller (2 to 4 kHz depending on the rating) and continuous operation without derating. Switching frequencies are detailed in the section on "Technical Specifications".

Using the ATV-58 with a higher switching frequency :

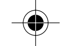
- For continuous operation derate by one power rating, for example, for applications with high overtorque : ATV-58HD16M2X for 7.5 kW — ATV-58HD28N4X for 15 kW — ATV-58HD54N4X for 30 kW.

- If no power derating is applied, do not exceed the following operating conditions : Cumulative running time 36 s max. per 60 s cycle (load factor 60 %).

(3) For 60 seconds.

(4) These dissipated power levels are given for the maximum permissible switching frequency for the speed controller in continuous operation (2 or 4 kHz, depending on the rating).

(5) Speed controllers ordered under references ATV-58P●●●M2 and ATV-58P●●●N4 are supplied with a display module. Speed controllers ordered under the same references ending in Z (ATV-58HD●●M2XZ and ATV-58HD●●N4XZ) are supplied without a display module.
The additional letter Z only appears on the packaging.

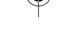



Selecting a Speed Controller on a Baseplate with Built-in EMC Filters

Line supply				Motor		Altivar 58				
Supply voltage (1) U1…U2	Line current (2) at U1	at U2	Max. prospective line Isc at U1	Power indicated on plate at U2 (3)		Nominal current	Max. transient current (4)	Power dissipated at nominal load (5)	Reference (6)	Weight

High torque applications (170% Tn)

V	A	A	kA	kW	HP	A	A	W		kg
200…240 50/60 Hz single-phase	5.6	4.7	2	0.37	0.5	2.3	3.1	25	ATV-58PU09M2	1.8
	9.8	8.3	2	0.75	1	4.1	5.6	30	ATV-58PU18M2	1.8
	18.5	15.6	5	1.5	2	7.8	10.6	40	ATV-58PU29M2	2.9
	24.8	21.1	5	2.2	3	11	15	50	ATV-58PU41M2	2.9
	24.7	21.3	5	3	–	13.7	18.6	70	ATV-58PU72M2(7)	4.8
	35	30	22	4	5	18.2	24.7	75	ATV-58PU90M2(7)	11.5
	46	39.4	22	5.5	7.5	24.2	32.9	100	ATV-58PD12M2(7)	11.5
200…240 50/60 Hz 3-phase	9.7	8.3	5	1.5	2	7.8	10.6	40	ATV-58PU29M2	2.9
	13.4	11.4	5	2.2	3	11	15	50	ATV-58PU41M2	2.9
	17.2	15	5	3	–	13.7	18.6	60	ATV-58PU54M2	4.8
	22.4	19.5	5	4	5	18.2	24.7	70	ATV-58PU72M2	4.8
	34.7	30	22	5.5	7.5	24.2	32.9	75	ATV-58PU90M2	11.5
	44.4	38.2	22	7.5	10	31	42.2	100	ATV-58PD12M2	11.5
380…500 50/60 Hz 3-phase	3.4	2.6	5	0.75	1	2.3	3.1	35	ATV-58PU18N4	2.9
	6	4.5	5	1.5	2	4.1	5.6	40	ATV-58PU29N4	2.9
	7.8	6	5	2.2	3	5.8	7.9	50	ATV-58PU41N4	2.9
	10.2	7.8	5	3	–	7.8	10.6	55	ATV-58PU54N4	4.8
	13	10.1	5	4	5	10.5	14.3	65	ATV-58PU72N4	4.8
	17	13.2	5	5.5	7.5	13	17.7	80	ATV-58PU90N4	4.8
	26.5	21	22	7.5	10	17.6	24	90	ATV-58PD12N4	11.5
	35.4	28	22	11	15	24.2	32.9	110	ATV-58PD16N4	11.5
	44.7	35.6	22	15	20	33	44.9	140	ATV-58PD23N4	13.5



Selecting a Speed Controller on a Baseplate with Built-in EMC Filters

(1) Nominal supply voltages : min. U1, max. U2.

(2) Typical value for a 4-pole motor with no additional choke except in single-phase for ATV-58PU72M2, U90M2 and D12M2 (7).

(3) These power levels are for a maximum switching frequency of 4 kHz in continuous operation. Switching frequencies are detailed in the section on "Technical Specifications".

Using the ATV-58 with a higher switching frequency :

- For continuous operation derate by one power rating, for example :
  ATV-58PU09M2 for 0.25 kW – ATV-58PU18N4 for 0.37 kW – ATV-58PD12N4 for 5.5 kW.

- If no power derating is applied, do not exceed the following operating conditions :
  Cumulative running time 36 s max. per 60 s cycle (load factor 60 %).

(4) For 60 seconds.

(5) The power levels shown here concern the proportion of losses dissipated internally. Other losses are dissipated externally via the additional heatsink or the machine frame.
These power levels are given for the maximum permissible switching frequency in continuous operation (4 kHz).

(6) Speed controllers ordered under references ATV-58P●●●M2 and ATV-58P●●●N4 are supplied with a display module. Speed controllers ordered under the same references ending in Z (ATV-58P●●●●●Z) are supplied without a display module. **The additional letter Z only appears on the packaging.**

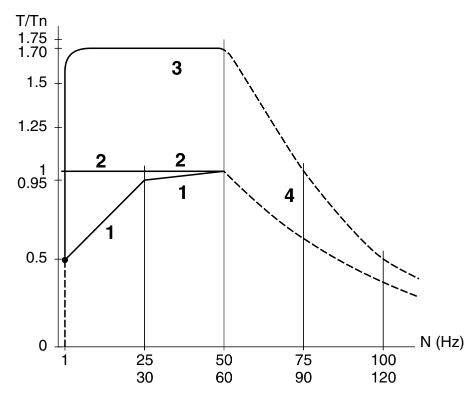



(7) A line choke must be used if the speed controllers are to be connected to a single-phase line supply (see selection table in catalog).

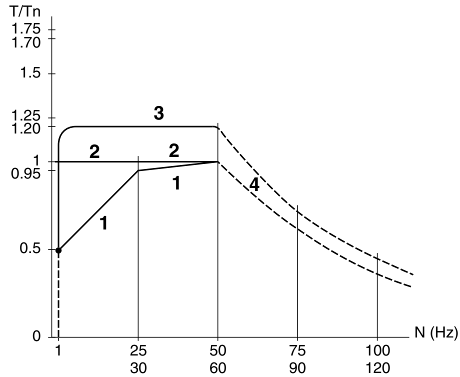
Available Torque

Torque characteristics :

• High torque applications :



• Standard torque applications :



1 Self-cooled motor : continuous useful torque

2 Force-cooled motor : continuous useful torque

3 Transient overtorque for max. 60 seconds.

4 Torque at overspeed with constant power

Available overtorque :

- High torque applications :
  200 % of nominal motor torque for 2 seconds, and 170 % for 60 seconds.

- Standard torque applications :
  140 % of nominal motor torque for 2 seconds, and 120 % for 60 seconds.

Continuous operation

For self-cooled motors, cooling is linked to the motor speed. Derating therefore occurs at speeds of less than half the nominal speed.

Overspeed operation

As the voltage can no longer change with the frequency, there is a reduction in torque. Check with the manufacturer that the motor can operate at overspeed.

Note : With a special motor the nominal and maximum frequencies can be adjusted from 40 to 500 Hz using the operator display module, the programming terminal or the PC software.



Technical Specifications

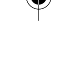
Environment

Degree of protection	IP 21 and IP 41 on upper part (conforming to EN 50178)
Vibration resistance	Conforming to IEC 68-2-6 : • 1.5 mm peak from 2 to 13 Hz • 1 gn from 13 to 200 Hz.
Shock resistance	Conforming to IEC 68-2-27 : • 15 g, 11 ms)
Maximum ambient pollution	Speed controllers ATV-58HD16M2X to D46M2X, ATV-58HD28N4 to D79N4 and ATV-58HD28N4X to D79N4X : • Degree 3 conforming to UL508C Other speed controllers : • Degree 2 conforming to IEC 664-1 and EN 50718.
Maximum relative humidity	93 % without condensation or dripping water conforming to IEC 68-2-3
Ambient temperature around the unit	Storage : - 25 °C to + 65 °C Operation : ATV-58P speed controllers, all ratings : • - 10 °C to + 40 °C Speed controllers ATV-58HU09M2 to U72M2 and ATV-58HU18N4 to U90N4 : • - 10 °C to + 50 °C without derating • up to + 60 °C derating the current by 2.2 % per °C over 50°C Speed controllers ATV-58HU90M2 to D12M2 and ATV-58HD12N4 to D23N4 : • - 10 °C to + 40 °C without derating • up to + 50 °C derating the current by 2.2 % per °C over 40 °C Speed controllers ATV-58HD16M2X to D46M2X, ATV-58HD28N4 to D79N4 and ATV-58HD28N4X to D79N4X : • - 10 °C to + 40 °C without derating • up to + 60 °C with fan kit derating the current by 2.2 % per °C over 40 °C
Maximum operating altitude	1000 m without derating (above this derate the current by 1 % for each additional 100 m)
Operating position	Vertical

Technical Specifications

Electrical specifications

Power supply	Voltage	Speed controllers ATV-58●●●●M2 : • 200 V - 10 % to 240 V + 10 % single-phase and 3-phase Speed controllers ATV-58HD●●M2X : • 208 V - 10 % to 240 V + 10 % 3-phase Speed controllers ATV-58●●●●N4 and ATV-58●●●●N4X : • 380 V - 10 % to 500 V + 10 % 3-phase
	Frequency	50/60 Hz ± 5 %
Output voltage		Maximum voltage equal to line supply voltage
Electrical isolation		Electrical isolation between power and control (inputs, outputs, power supplies)
Output frequency range		0.1 to 500 Hz
Switching frequency		Configurable : • without derating : 0.5 - 1 - 2 - 4 kHz for speed controllers ATV-58●U09M2 to D23M2X, ATV-58●U18N4 to D46N4 and ATV-58HD28N4X to D46N4X 0.5 - 1 - 2 kHz for speed controllers ATV-58HD28M2X to D46M2X, ATV-58HD54N4 to D79N4 and ATV-58HD54N4X to D79N4X • without derating with intermittent operating cycle or with derating by one power rating in continuous operation : 8 - 12 - 16 kHz for speed controllers ATV-58●U09M2 to D12M2 and ATV-58●U18N4 to D23N4 8 - 12 kHz for speed controllers ATV-58HD16M2X to D23M2X, ATV-58HD28N4 to D46N4 and ATV-58HD28N4X to D46N4X 4 - 8 kHz for speed controllers ATV-58HD28M2X to D46M2X, ATV-58HD54N4 to D79N4 and ATV-58HD54N4X to D79N4X
Speed range		1 to 100
Braking torque		30 % of motor nominal torque without braking resistor (typical value). Up to 150 % with braking resistor fitted as option
Transient overtorque		200 % (or 140 % for standard torque) of motor nominal torque (typical values to ±10 %) for 2 seconds 170 % (or 120 % for standard torque) of motor nominal torque (typical values to ±10 %) for 60 seconds
Protection and safety features of speed controller		- Short-circuit protection : . between output phases . between output phases and earth . on internal supply outputs - Thermal protection against overheating and overcurrents - Undervoltage and overvoltage supply - Loss of supply phase safety circuit (avoids single-phase operation on 3-phase speed controllers)
Motor protection		- Thermal protection integrated in speed controller via continuous calculation of I^2t taking speed into account Memorization of motor thermal state when speed controller is powered down Function can be modified (using display module or programming terminal or PC software) depending on the type of motor cooling - Protection against motor phase breaks - Protection via PTC probes with option card

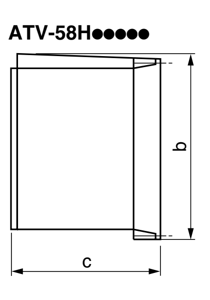


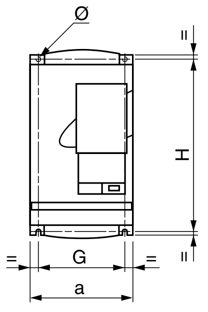


Dimensions - Mounting Recommendations

Dimensions

ATV-58H●●●●●

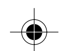




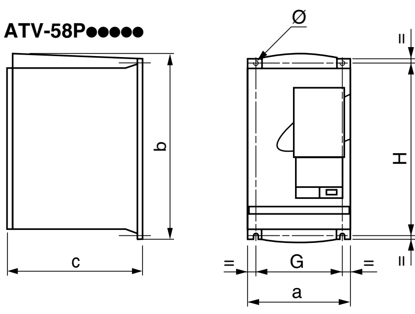
ATV-58H	a	b	c	G	H	Ø
U09M2, U18M2	113	206	167	96	190	5
U29M2, U41M2, U18N4, U29N4, U41N4	150	230	184	133	210	5
U54M2, U72M2, U54N4, U72N4, U90N4	175	286	184	155	270	5.5
U90M2, D12M2, D12N4, D16N4	230	325	210	200	310	5.5
D23N4	230	415	210	200	400	5.5
D16M2X, D23M2X, D28N4, D33N4, D46N4	240	550	283	205	530	7
D28N4X, D33N4X, D46N4X	240	550	283	205	530	7
D28M2X, D33M2X, D46M2X, D54N4, D64N4, D79N4	350	650	304	300	619	9
D54N4X, D64N4X, D79N4X	350	650	304	300	619	9

Fan flow rate

ATV-58HU09M2, U18M2, U18N4	not cooled
ATV-58HU29M2, U54M2, U29N4, U41N4, U54N4	36 m^3/hour
ATV-58HU41M2	47 m^3/hour
ATV-58HU72M2, U90M2, D12M2	72 m^3/hour
ATV-58HU72N4, U90N4, D12N4, D16N4, D23N4	72 m^3/hour
ATV-58HD16M2X, D23M2X, D28N4, D33N4, D46N4, D28N4X, D33N4X, D46N4X	292 m^3/hour
ATV-58HD28M2X, D33M2X, D46M2X, D54N4, D64N4, D79N4, D54N4X, D64N4X, D79N4X	492 m^3/hour



ATV-58P●●●●●



ATV-58P	a	b	c	G	H	Ø
U09M2, U18M2	113	206	132	96	190	5
U29M2, U41M2, U18N4, U29N4, U41N4	150	230	145	133	210	5
U54M2, U72M2, U54N4, U72N4, U90N4	175	286	151	155	270	5,5
U90M2, D12M2, D12N4, D16N4	230	325	159	200	310	5,5
D23N4	230	415	159	200	400	5,5

Fan flow rate : only the ATV-58PU41M2 speed controller has an internal fan with a flow rate of 11 m^3 /hour.

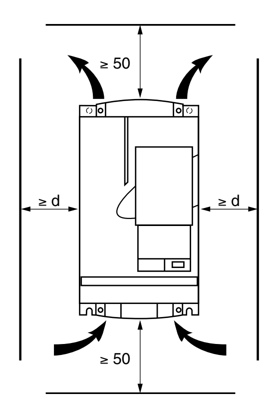
Mounting recommendations

Install the unit vertically at +/-10 °.
Do not place it close to heating elements.
Leave sufficient free space to ensure that the air required for cooling purposes can circulate from the bottom to the top of the unit.



Mounting and Temperature Conditions

ATV-58●U09M2 to D12M2 and U18N4 to D23N4



Free space in front of unit : 10 mm minimum.

ATV-58HU09M2 to U72M2 and ATV-58HU18N4 to U90N4 :

• From - 10°C to 40°C : d ≥ 50 mm : no special precautions.

d = 0 : remove the protective blanking cover from the top of the speed controller as shown overleaf (the degree of protection is then IP 20).

• From 40°C to 50°C : d ≥ 50 mm : remove the protective blanking cover from the top of the speed controller as shown overleaf (the degree of protection is then IP 20).

d = 0 : add control ventilation kit VW3-A5882● (see ATV-58 catalog).

• From 50°C to 60°C : d ≥ 50 mm : add control ventilation kit VW3-A5882● (see ATV-58 catalog). Derate the current by 2.2 % per °C over 50°C.

ATV-58HU90M2 to D12M2 and ATV-58HD12N4 to D23N4 :

• From - 10°C to 40°C : d ≥ 50 mm : no special precautions.

d = 0 : remove the protective blanking cover from the top of the speed controller as shown overleaf (the degree of protection is then IP 20).

• From 40°C to 50°C : d ≥ 50 mm : remove the protective blanking cover from the top of the speed controller as shown overleaf (the degree of protection is then IP 20).
Derate the current by 2.2 % per °C over 40°C.

d = 0 : add control ventilation kit VW3-A5882● (see ATV-58 catalog). Derate the current by 2.2 % per °C over 40°C.

ATV-58P●●●● :

• For mounting in enclosure

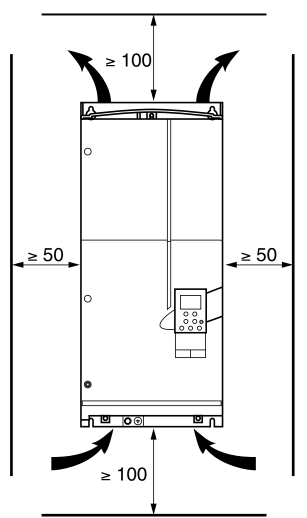
- External ambient temperature (VW3-A5880● coolest surface) : - 10°C to + 40°C.
- Temperature inside enclosure : same limits and conditions for mounting and any derating as for ATV-58H●●●●.

• Mounting on machine frame :

- Ambient temperature : -10°C to + 40°C.

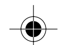
Mounting and Temperature Conditions

ATV-58HD16M2X, D46M2X, D28N4 to D79N4 and D28N4X to D79N4X



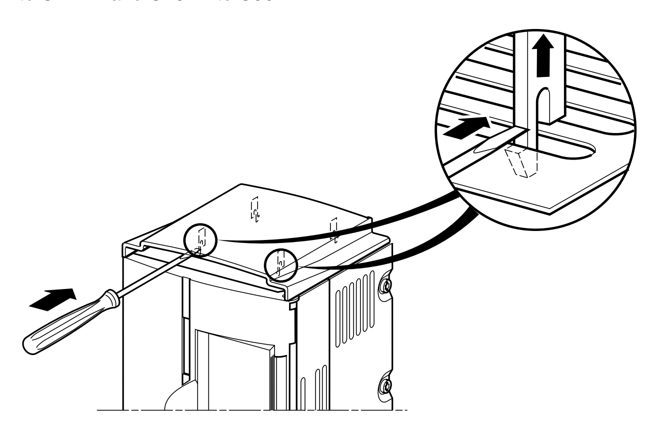
Free space in front of unit : 50 mm minimum.

- From - 10°C to 40°C : no special precautions.
- From 40°C to 60°C : add control card fan kit VW3A588●●● (see ATV-58 catalog). Derate the operating current by 2.2 % per °C over 40°C.

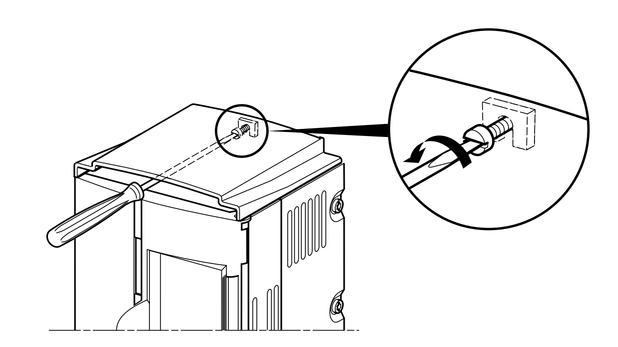



Removing the IP 41 Protective Blanking Cover

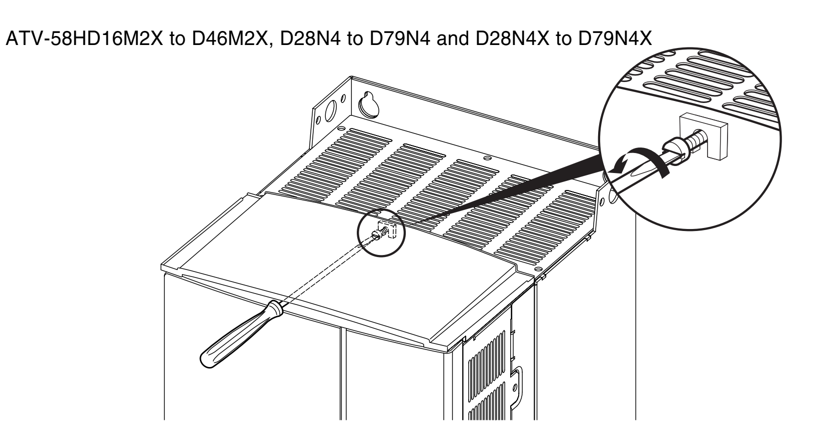
ATV-58●U09M2 to U72M2 and U18N4 to U90N4



ATV-58●U90M2, D12M2 and D12N4 to D23N4



ATV-58HD16M2X to D46M2X, D28N4 to D79N4 and D28N4X to D79N4X



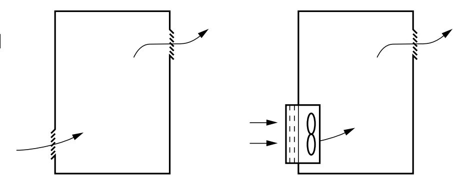


Mounting in a Wall-fixing or Floor-standing Enclosure

Observe the mounting recommendations on the previous page.

To ensure proper air circulation in the speed controller :

- Fit ventilation grilles
- Ensure that ventilation is adequate : if not install forced ventilation with a filter
- Use special IP 54 filters



Dust and damp proof metal enclosure (degree of protection IP 54)

The speed controller must be mounted in a dust and damp proof casing in certain environmental conditions : dust, corrosive gases, high humidity with risk of condensation and dripping water, splashing liquid, etc.

To avoid hot spots in the speed controller, add a fan to circulate the air inside the enclosure, reference VW3-A5882• (see ATV-58 catalog).

This enables the speed controller to be used in an enclosure where the maximum internal temperature can reach 60 °C.

Calculating the size of the enclosure

Maximum thermal resistance Rth (°C/W) :

$$Rth = \frac{\theta° - \theta°e}{P}$$

θ° = maximum temperature inside enclosure in °C
θ°e = maximum external temperature in °C
P = total power dissipated in the enclosure in W

Power dissipated by speed controller : see section Selecting a Speed Controller.
Add the power dissipated by the other equipment components.

Useful heat dissipation surface of casing S (m^2) :
(sides + top + front panel if wall-mounted)

$$S = \frac{K}{Rth}$$

K = thermal resistance per m^2 of casing

For metallic casing : K = 0.12 with internal fan
K = 0.15 without fan

Caution : Do not use insulated enclosures as they have a poor level of conductivity.

Using the speed controller on a baseplate reduces the power dissipated in the enclosure, which makes the IP 54 degree of protection easier to achieve.
From 11 kW at 208-240 V and 18.5 kW at 380-500 V, IP54 kits can be used to dissipate power to the outside by ventilation (see ATV58 catalog).

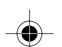


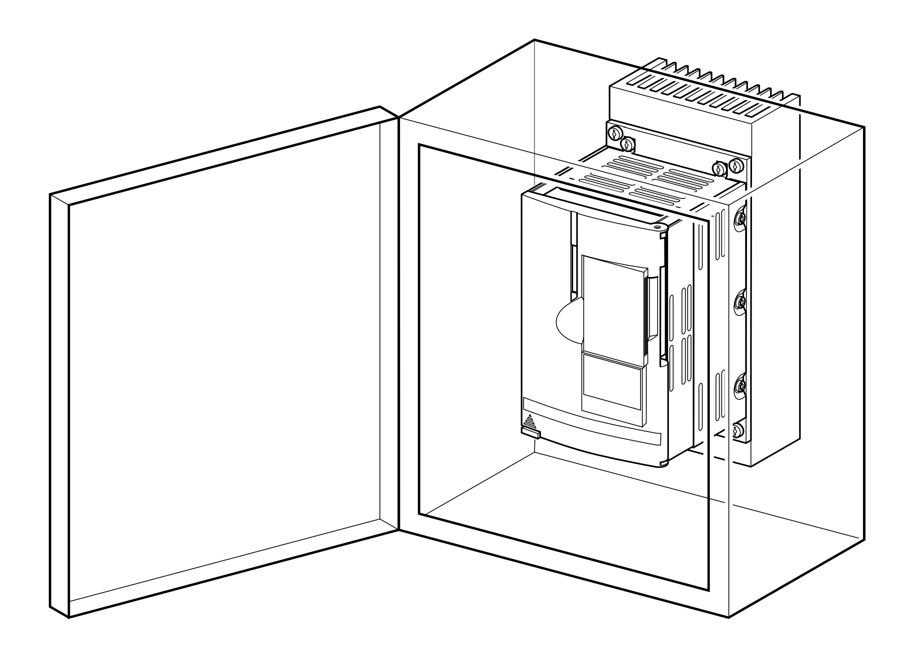
Mounting in Wall-fixing or Floor-standing Enclosure - Speed Controller on Baseplate

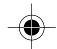
• Use the VW3-A5880● kit for dust and damp proof mounting (see ATV-58 catalog) and observe the mounting instructions supplied with the equipment.
Remember to fit the two thermal liners on each side of the metal sheet forming the casing. One liner is supplied with the speed controller, the other with the VW3-A5880● kit.

• The metal sheet or enclosure used for mounting the speed controller must have the following characteristics :
- thickness 1.5 to 3 mm
- metal sheet : stainless steel or painted steel, sufficiently smooth
- baked epoxy paintwork (do not use lacquer), max. thickness 70 µm, fine or medium texture.

• Check the thermal state of the speed controller as shown in the "Setup" section to ensure that the mounting is correct.

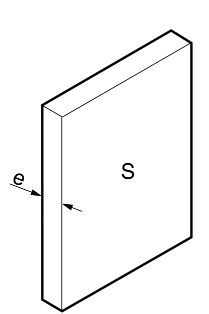






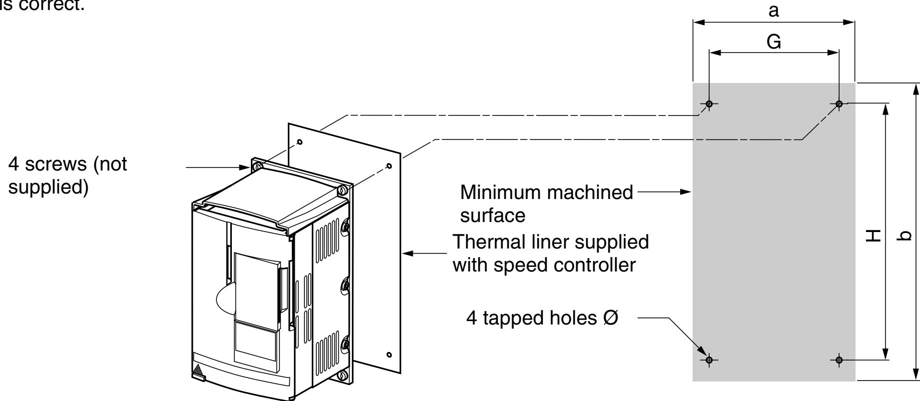
Mounting on Machine Frame - Speed Controller on Baseplate

Speed controllers on baseplates with the following ratings can be mounted on (or in) a cast iron or aluminum machine frame provided the following conditions are observed :
- Maximum ambient temperature : 40°C
- Mating surface on frame machined to provide 100 µm max. smoothness and 3.2 µm max. roughness.
- The speed controller must be mounted in the centre of a support (frame) with minimum thickness **"e"** and minimum square cooling surface **"S"** exposed to the open air.



Speed controller reference	Minimum surface **S** m^2	Minimum thickness **e** mm	
		Cast iron	Aluminum
ATV-58PU09M2 ATV-58PU18M2	0.25	20	10
ATV-58PU29M2 ATV-58PU41M2 ATV-58PU18N4 ATV-58PU29N4 ATV-58PU41N4	1		20

Check the thermal state of the speed controller as shown in the "Setup" section to ensure that the mounting is correct.

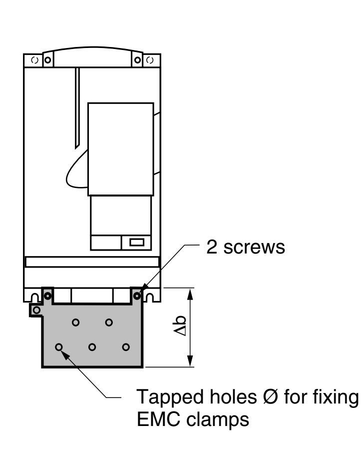


Lightly file the tapped holes to remove any burrs.

Speed controller reference	a mm	b mm	G mm	H mm	Ø mm
ATV-58PU09M2 ATV-58PU18M2	120	220	96	190	M4
ATV-58PU29M2 ATV-58PU41M2 ATV-58PU18N4 ATV-58PU29N4 ATV-58PU41N4	160	240	133	210	M5

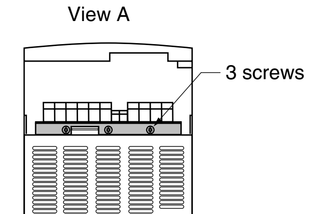
Electromagnetic Compatibility - Mounting

EMC mounting plate supplied with speed controller
Fix the EMC equipotentiality mounting plate to the holes in the ATV58 heatsink using the screws supplied as shown in the drawings below.

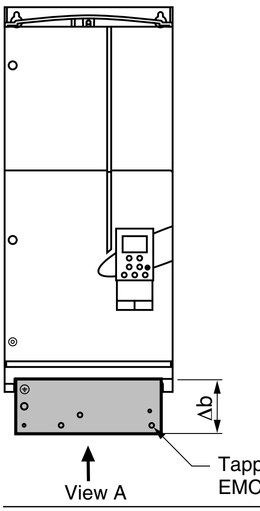


	Δb	Ø
ATV58●U09M2, U18M2,	63	4
ATV58●U29M2, U41M2, U18N4, U29N4, U41N4	64.5	4
ATV58●U54M2, U72M2, U54N4, U72N4, U90N4	64.5	4
ATV58●U90M2, D12M2, D12N4, D18N4,	76	4
ATV58●D23N4	76	4

View A



	Δb	Ø
ATV58HD16M2X, D23M2X, D28N4, D33N4, D46N4 D28N4X, D33N4X, D46N4X	80	5
ATV58HD28M2X, D33M2X, D46M2X, D54N4, D64N4, D79N4 D54N4X, D64N4X, D79N4X	110	5

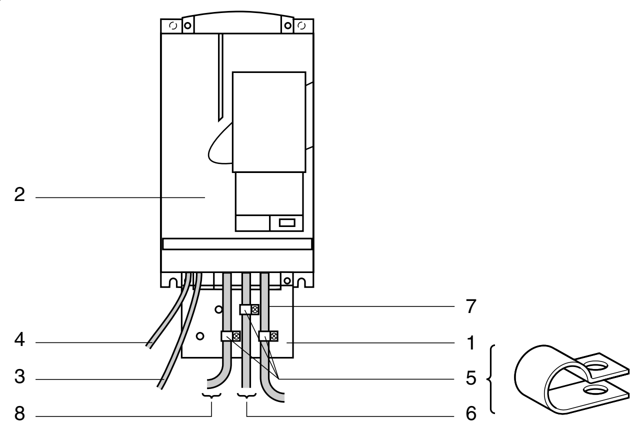


Electromagnetic Compatibility - Wiring

Principle

- Grounds between speed controller, motor and cable shielding must have "high frequency" equipotentiality.
- Use shielded cables with shielding connected to the ground at 360° at both ends of the motor cable, braking resistor (if fitted) and control-command cables. Conduit or metal ducting can be used for part of the shielding length provided that there is no break in continuity.
- Ensure maximum separation between the power supply cable (line supply) and the motor cable.

Installation diagram





1 - Metal sheet machine grounding supplied with the speed controller, to be mounted as shown in the drawing
2 - Altivar 58
3 - Non-shielded power supply wires or cable
4 - Non-shielded wires for fault relay contacts output
5 - Fix and ground the shielding of cables 6, 7 and 8 as close as possible to the speed controller :
- strip the shielding
- use the correct size clamps on the stripped part of the shielding to fix to metal sheet 1
The shielding must be clamped tightly enough to the metal sheet to ensure good contact
- clamp types : stainless steel

6 - Shielded cable for motor connection with shielding connected to ground at both ends
The shielding must be continuous and intermediate terminals must be in EMC shielded metal cases
7 - Shielded cable for connecting the control/command system
For applications requiring several conductors, use small cross-sections (0.5 mm²).
The shielding must be connected to ground at both ends. The shielding must be continuous and intermediate terminals must be in EMC shielded metal cases.
8 - Shielded cable for connecting braking resistor (if fitted). The shielding must be connected to ground at both ends. The shielding must be continuous and intermediate terminals must be in EMC shielded metal cases.

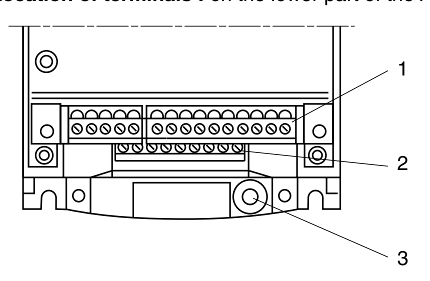
Note :
• If using an additional input filter, it should be mounted under the speed controller (ATV-58H) or to one side (ATV-58P), and connected directly to the line supply via an unshielded cable. Link **3** on the speed controller is via the filter output cable.
• The HF equipotential ground connection between the speed controller, motor and cable shielding does not remove the need to connect the PE protective conductors (green-yellow) to the appropriate terminals on each unit.

Access to Terminals - Power Terminals

Access to terminals

To access the terminals, switch off the speed controller, then unlock and open the hinged cover.

Location of terminals : on the lower part of the Altivar.



1 - Control
2 - Power
3 - Terminal for connecting a protective conductor with a 10 mm² cross-section conforming to EN50178 (earth leakage current)

Power Terminals

Terminal specifications

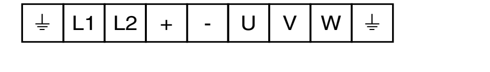
Altivar ATV-58●	Terminals	Maximum connection capacity AWG	mm²	Tightening torque in Nm
U09M2, U18M2	all terminals	AWG 14	1.5	0.5
U29M2, U41M2, U18N4 U29N4, U41N4	all terminals	AWG 8	6	0,75
U54M2, U72M2, U54N4 U72N4, U90N4	all terminals	AWG 8	6	0,75
U90M2, D12M2, D12N4 D16N4, D23N4	all terminals	AWG 6	10	2

Altivar ATV-58H	Terminals	Maximum connection capacity AWG	mm²	Tightening torque in Nm
D28N4, D28N4X,	PA PB	AWG 6	10	2
	other terminals	AWG 4	16	3
D16M2X, D23M2X, D33N4, D46N4 D33N4X, D46N4X	PA PB	AWG 4	16	3
	other terminals	AWG 2	35	4
D28M2X, D33M2X, D46M2X, D54N4, D64N4, D79N4 D54N4X, D64N4X, D79N4X	PA PB	AWG 2	35	4
	other terminals	AWG 2/0	70	10



Power Terminals

Arrangement of terminals



ATV-58●U09M2 and U18M2

⏚	L1	L2	L3	PA	PB	U	V	W	⏚

ATV-58●U29M2 to D12M2
and ATV-58●U18N4 to D23N4

⏚	L1	L2	L3	+	-	PA	PB	U	V	W	⏚

ATV-58HD16M2X to D46M2X,
ATV-58HD28N4 to D79N4
and ATV-58HD28N4X to D79N4X

Function of terminals

Terminals	Function	For Altivar ATV-58●
⏚	Altivar ground terminal	All ratings
L1 L2	Power supply	All ratings
L3		All ratings except U09M2 and U18M2
+ -	DC bus outputs	U09M2 and U18M2 D16M2X to D46M2X D28N4 to D79N4 D28N4X to D79N4X
PA PB	Output to braking resistor	All ratings except U09M2 and U18M2
U V W	Outputs to motor	All ratings
⏚	Altivar ground terminal	All ratings

Access to DC bus : connecting an external DC supply

For ATV58●U09M2 and U18M2, an external DC supply is connected directly to the speed controller + and - terminals.

For ATV58●U29M2 to D12M2 and ATV●U18N4 to D23N4, connect the supply + to the PA terminal and connect the supply - to the J16 tag connector located next to the power terminal.

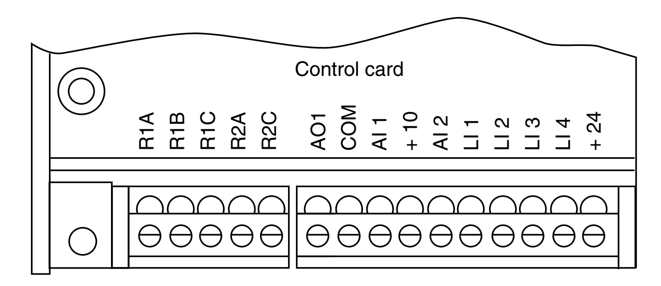
For ATV58HD16M2X to D46M2X, ATV58HD28N4 to D79N4 and ATV58HD28N4X to D79N4X, an external DC supply is connected to the speed controller + and - terminals, but an external device with resistors for preloading the filter capacitors is required.

Control Terminals

Terminal characteristics

- Connection terminal for shielding : for metal connector or clamp
- 2 removable terminals, one for relay contacts, the other for low level I/O
- Maximum connection capacity : 1.5 mm² - AWG 14
- Max. tightening torque : 0.4 Nm.

Arrangement of terminals



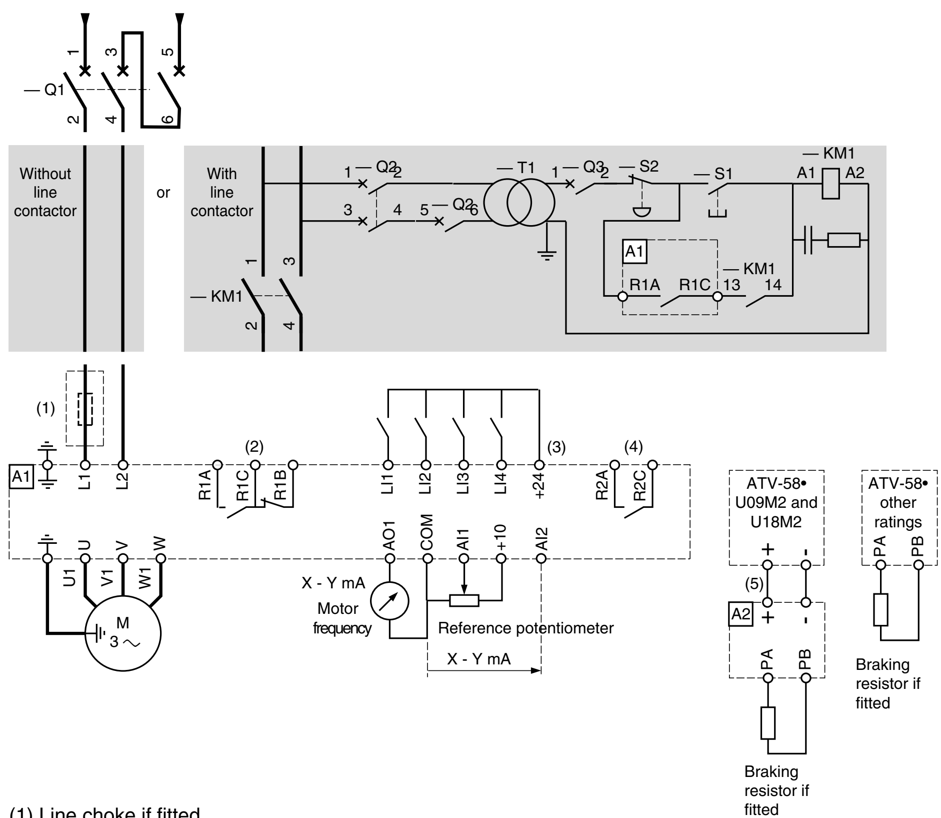
Function of terminals

Terminal	Function	Electrical characteristics
R1A R1B R1C	C/O contact at common point (R1C) of R1 fault relay	Min. switching capacity : - 10 mA for 24 V⎓ Max. switching capacity on inductive load (cos φ 0.4 and L/R 7 ms) : 1.5 A for 250 V~ and 30 V⎓
R2A R2C	N/O contact of R2 programmable relay	
AO1	Current analog output	Analog output X - Y mA, X and Y are programmable Factory preset to 4 - 20 mA / impedance 500 Ω
COM	Common for logic and analog inputs	
AI1	Analog input for voltage	Analog input 0 + 10 V Impedance 30 kΩ
+10	Power supply for potentiometer with setpoint 1 to 10 kΩ	+10 V (- 0, + 10 %) 10 mA max. protected against short-circuits and overloads
AI2	Analog input for current	Analog input X - Y mA, X and Y are programmable Factory preset to 4 - 20 mA / impedance 100 Ω
LI1 LI2 LI3 LI4	Logic inputs	Programmable logic inputs Impedance 3.5 kΩ Power supply + 24 V (max. 30 V) State 0 if < 5 V, state 1 if > 11 V
+ 24	Power supply for inputs	+ 24 V protected against short-circuits and overloads, min. 18 V, max. 30 V Max. flow rate 200 mA



Connection Diagrams

Single-phase power supply



(1) Line choke if fitted.
(2) Fault relay contacts for remote signalling of speed controller status.
(3) + 24 V internal. If using with a + 24 V external supply, connect its 0 V to the COM terminal - do not use the speed controller + 24 terminal - and connect the LI inputs common to the + 24 V of the external supply.
(4) R2 reassignable relay.
(5) A2 braking module VW3 A58701 if using a braking resistor for U09M2 and U18M2 ratings only.

Note : Fit interference suppressors to all inductive circuits near the speed controller or connected on the same circuit, such as relays, contactors, solenoid valves, fluorescent lighting, etc.



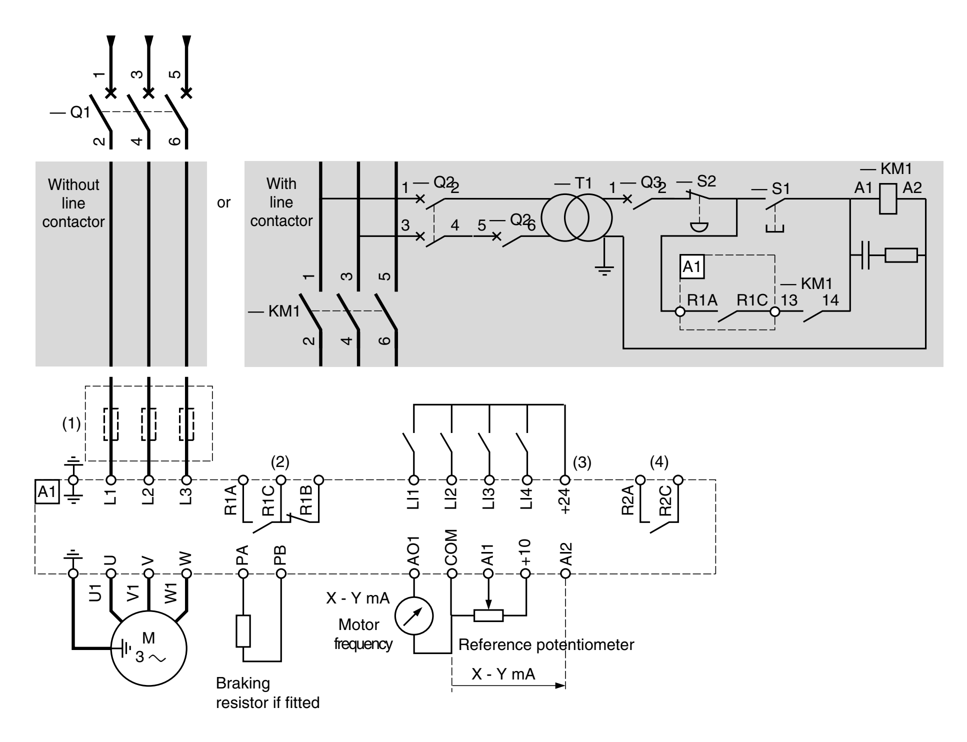
The "Supply phase loss" fault, code IPL, must be configured to "No" for these 3-phase speed controllers to operate on a single-phase supply. If this fault remains in its factory set-up (Yes), the speed controller will remain locked on a "PHF" fault.

Components which can be used in association with the Altivar : see catalog.



Connection Diagrams

3-phase power supply



(1) Line choke if fitted (ATV-58●U29M2 to D12M2 and U18N4 to D23N4).
(2) Fault relay contacts for remote signalling of speed controller status.
(3) + 24 V internal. If using with an + 24 V external supply, connect its 0 V to the COM terminal - do not use the speed controller + 24 terminal - and connect the LI inputs common to the + 24 V of the external supply.
(4) R2 reassignable relay.

Note : Fit interference suppressors to all inductive circuits near the speed controller or connected on the same circuit, such as relays, contactors, solenoid valves, fluorescent lighting, etc.

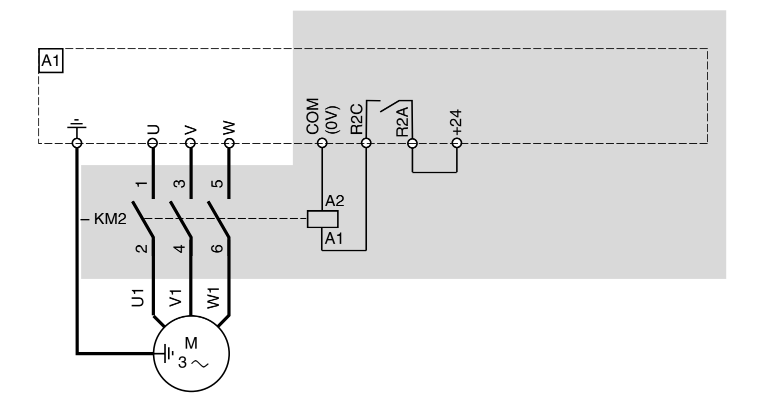
Components which can be used in association with the Altivar : see catalog.



Connection Diagrams

Diagram with downstream contactor for ATV-58●U09M2 to D12M2 and U18N4 to D23N4

The shaded part should be added to the various diagram types (single-phase, 3-phase, etc).



Use the "downstream contactor control" function with relay R2, or logic output LO (⎓ 24 V) with an I/O extension card.
Consult the programming manual.

Note : Fit interference suppressors to all inductive circuits near the speed controller or connected on the same circuit, such as relays, contactors, solenoid valves, fluorescent lighting, etc.

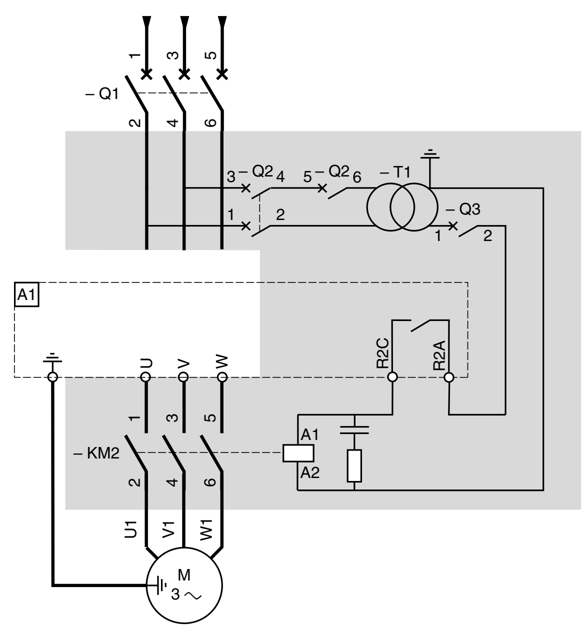
Components which can be used in association with the Altivar : see catalog.



Connection Diagrams

Diagram with downstream contactor for ATV-58HD16M2X to D46M2X, D28N4 to D79N4 and D28N4X to D79N4X

The shaded part should be added to the 3-phase power supply diagram.

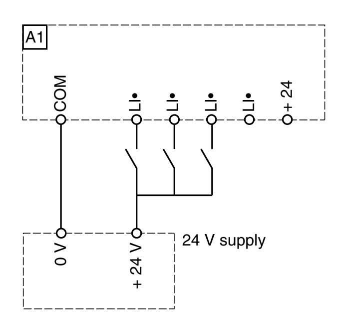


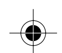
Use the "downstream contactor control" function with relay R2, or logic output LO (⎓ 24 V) switching the coil using an I/O extension card.
Consult the programming manual.

Note : Fit interference suppressors to all inductive circuits near the speed controller or connected on the same circuit, such as relays, contactors, solenoid valves, fluorescent lighting, etc.

Components which can be used in association with the Altivar : see catalog.

24 V external supply for supplying logic inputs





Wiring recommendations, use

Power

Observe the cable cross-sectional areas recommended in the standards.

The speed controller must be earthed to conform with the regulations concerning high leakage currents (over 3.5 mA). Do not use a residual current device for upstream protection on account of the DC elements which may be generated by leakage currents. If the installation involves several speed controllers on the same line, each speed controller must be earthed separately. If necessary, fit a line choke (consult the catalog).

Keep the power cables separate from circuits in the installation with low-level signals (detectors, PLCs, measuring apparatus, video, telephone).

Control

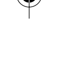
Keep the control circuits and the power cables apart. For control and speed reference circuits, we recommend using shielded twisted cables with a pitch of between 25 and 50 mm, connecting the shielding to each end.

Recommendations for use

In power control mode using a **line contactor** :



- **Do not switch contactor KM1 frequently** (otherwise premature aging of the filtering capacitors will occur) **and use inputs LI1 to LI4 to control the speed controller.**



- **If the cycles are longer than 60 s these measures are absolutely necessary**.

If safety standards necessitate isolation of the motor, fit a contactor on the speed controller output and use the "downstream contactor control" function (consult the programming manual).

Fault relay, unlocking

The fault relay is energized when the speed controller is powered up and is not faulty. It has one C/O contact at the common point.

The speed controller is unlocked after a fault by :

- powering down the speed controller until both the display and indicator lamps go out, then powering up again
- automatically or remotely via logic input : consult the programming manual.

Programmable I/O, functions :

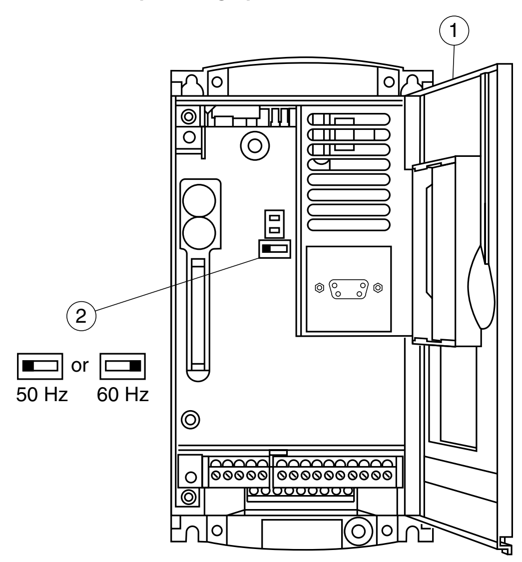
Consult the programming manual.



Setup

The Altivar is factory preset for the most common operating conditions.

☞ **Prior to powering up the Altivar :**



Unlock and open the cover ① of the Altivar on its hinges to access the 50/60 Hz selector switch ② on the control board.
If an option card is present, the selector switch can be accessed through it.
Position the selector switch on 50 or 60 Hz, whichever corresponds to your motor.

Preset operating point :

50 Hz position (factory set-up) :
- 230 V 50 Hz for ATV-58●●●●M2 and M2X
- 400 V 50 Hz for ATV-58●●●●N4 and N4X

60 Hz position :
- 230 V 60 Hz for ATV-58●●●●M2 and M2X
- 460 V 60 Hz for ATV-58●●●●N4 and N4X

Several tools are available to help with setup :

- display module — ref : VW3 A58101 (the speed controller is supplied with or without this display module, according to the reference ordered).
- PowerSuite solutions — (see catalogue)

Refer to the documentation provided with each of the tools for information on setup and maintenance of the Altivar.

If your Altivar is equipped with an I/O extension or communication card, consult the documentation supplied with the card.

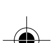
Reminder for IT neutral point connection : in the event of use on a 3-phase network with a voltage greater than 480V ±10% with an isolated or high-impedance neutral system (IT), the internal EMC filter capacitors which are connected to ground must be disconnected except for ATV-58HD28N4 to HD79N4 and for ATV-58H●●●●●X. Consult Schneider product support who are the only people qualified to perform this operation.

Checking the thermal state of the speed controller

The mounting of the speed controllers on ATV-58P●●●●● baseplates must be checked, especially when mounting on the machine frame.

Proceed as follows :
- Operate the speed controller at the maximum operating and temperature conditions for the application.
- Using the display module, programming terminal or PC software, observe until the following parameter stabilizes :
DriveThermal. tHd (menu 1-SUPERVISION)

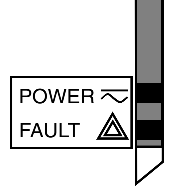
It must not exceed 100 %.
If this value is exceeded, check the mounting, conditions of use and size of the speed controller.



Operation - Maintenance - Spares and Repairs

Operation

Signalling on the front panel of the Altivar



Green LED **POWER**  on : Altivar powered up

Red LED **FAULT**
- on : Altivar faulty
- flashing : Altivar locked following use of the "STOP" button on the display module or a configuration change. The motor must not be powered up until the "forward", "reverse" and "shutdown via injection" commands have been reset.

Display mode on display module screen

Displays preset frequency set point or faults.

The display mode can be modified via the display module : consult the programming manual.

Maintenance

Before working with the equipment, **switch off the power supply, check that the green LED is off and wait for the capacitors to discharge** (approximately 3 minutes).





The DC voltage at the + and - terminals or PA and PB terminals may reach 850 V depending on the line supply voltage.

If problems arise during setup or operation, first ensure that the recommendations relating to environment, mounting and connections have been observed.

Maintenance

The Altivar 58 does not require preventative maintenance. We nevertheless advise you regularly to :

- Check the condition and tightness of connections

- Ensure that the temperature around the unit remains at an acceptable level and that ventilation is effective (average service life of fans : 3 to 5 years depending on operating conditions)

- Remove dust from the speed controller if necessary

Assistance with maintenance

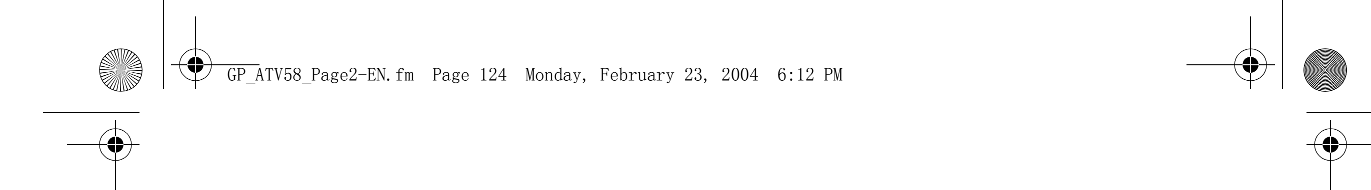
The first fault detected is memorized and displayed on the display module screen if power is maintained : the speed controller locks, the red LED lights up, and the R1 fault relay is activated.

Consult the programming manual.

Spares and repairs

For spare parts and repairs to Altivar 58 speed controllers, consult Schneider group product support.



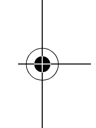


GP_ATV58_Page2-EN.fm Page 124 Monday, February 23, 2004 6:12 PM

Warning

This document relates to use of the Altivar 58 exclusively with :

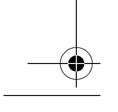
- the VW3A58101 display module
- a VW3A58201 or VW3A58202 I/O extension card if applicable.

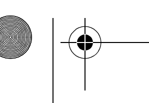
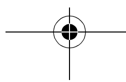
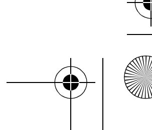



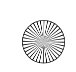
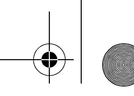
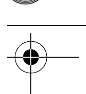
Some modes, menus and types of operation can be modified if the speed controller is equipped with other options. Please refer to the relevant documentation for each of these options.

Since it was first commercialised, the Altivar 58 has had additional functions included. This document can be used with earlier devices, but parameters described here may be missing from those speed controllers.

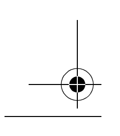
For installation, connection, setup and maintenance instructions, please refer to the Altivar 58 and the I/O extension card User's Manuals as required.

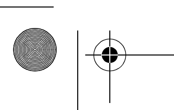
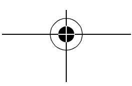
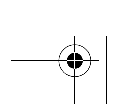
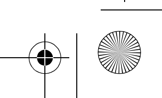


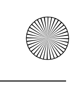
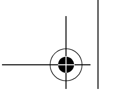




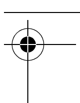





Contents



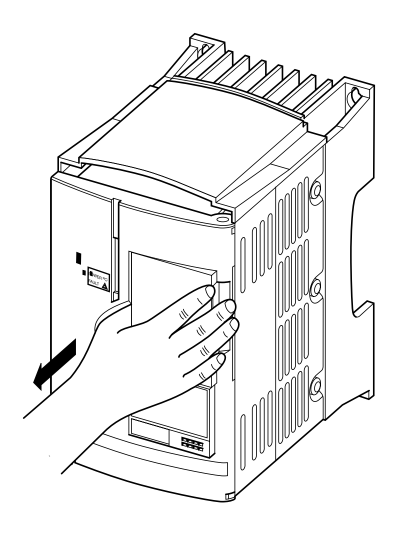


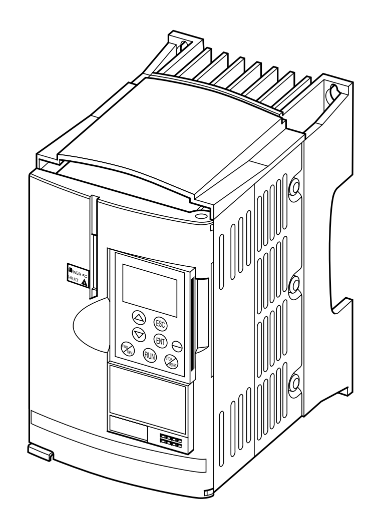

Introduction

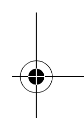
The VW3A58101 display module is supplied with ATV58••••M2 and ATV58••••N4 speed controllers.
ATV58••••••Z speed controllers are supplied without a display module. This can be ordered separately.

Installing the display module on the speed controller :

The protective cover should be removed before installing the display module on an ATV58••••••Z speed controller.





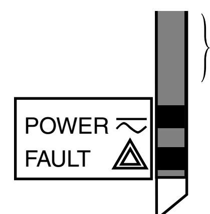


The display module must be connected and disconnected with the power off. If the display module is disconnected when control of the speed controller via the display module is enabled, the speed controller locks in fault mode SLF.

Installing the display module remotely :

Use the kit, reference VW3A58103, comprising 1 cable with connectors, the parts required for mounting on an enclosure door and the installation guide.

Signaling on the front panel of the Altivar



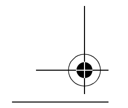
Other LEDs, indicating status with communication option cards.

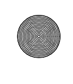
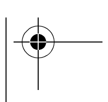
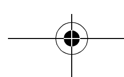
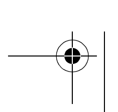
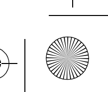


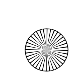
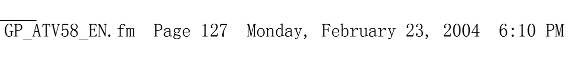
Green LED POWER — on : Altivar powered up

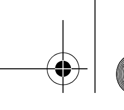
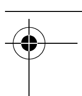


Red LED FAULT
- on : Altivar faulty
- flashing : Altivar locked once the "STOP" key has been pressed on the display module or after a change to the configuration. The motor can then only be supplied with power after resetting prior to the "forward", "reverse", and "injection stop" commands.



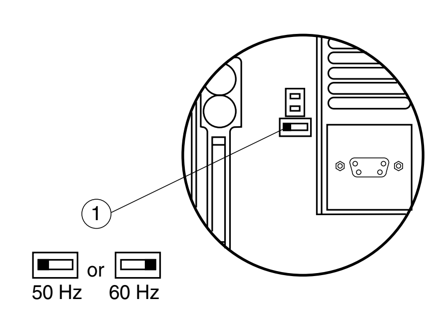






Introduction

☞Before switching the Altivar on and before using the display module :



Unlock and open the cover of the Altivar to access the 50/60þHz selector switch ① on the control card. If an option card is present, the selector switch can be accessed through it.
Position the selector switch on 50þorþ60þHz, whichever corresponds to your motor.

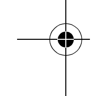
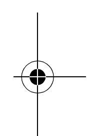
Preset operating point :

50 Hz position (factory setting) :
- 230 V 50 Hz for ATV58••••M2
- 400 V 50 Hz for ATV58••••N4

60 Hz position :
- 230 V 60 Hz for ATV58••••M2
- 460 V 60 Hz for ATV58••••N4

The display module is used for :

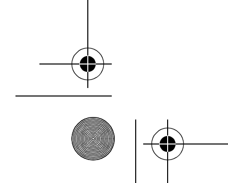
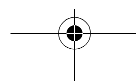
- Displaying the drive identification, electrical values, operating or fault parameters
- Altering the Altivar settings and configuration
- Operating in local control mode via the keypad
- Saving and restoring the configuration in a non-volatile memory in the display module

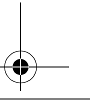



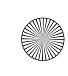
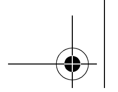
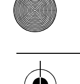
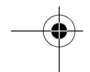
☞Return to factory settings:

- Switch off the drive
- Unlock and open the Altivar cover in order to access the 50/60þHz switch ① on the control card. If an option card is present, the selector switch can be accessed through it.
- Change the position of the 50/60þHz switch ① on the control card
- Switch on the drive
- Switch off the drive
- Reset the 50/60þHz switch ① on the control card to its initial position (nominal motor frequency)

Switch on the drive, and it reverts to its factory configuration.

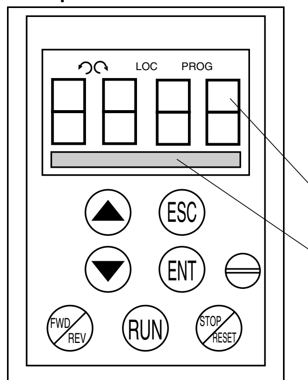


Introduction

Front panel





Use of keys and meaning of displays

↺ ↻ Flashing :
indicates the selected direction of rotation
Steady :
indicates the direction of motor rotation

LOC Indicates control via the display module

PROG Appears in setup and programming mode
Flashing :
indicates that a value has been modified but not saved

4-character display :
displays numeric values and codes

One line of 16 characters :
displays messages in plain text

  Scroll through menus or parameters and set a value



 Return to the previous menu or abort the current adjustment and return to the original value

 Select a menu, confirm and save a selection or setting

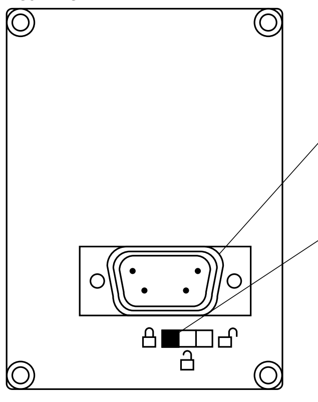
If control via the display module is selected :

 Reverse the direction of rotation

 Command to start the motor running

 Command to stop the motor or reset the fault. The key's "STOP" function can be inhibited via the program ("CONTROL" menu).

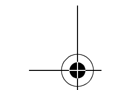
Rear view

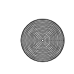
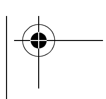
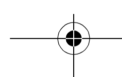
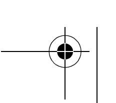
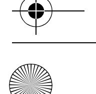


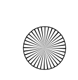
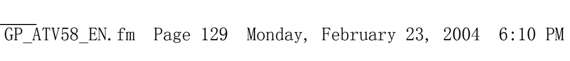
Connector :
- for direct connection of the display module to the speed controller
- for remote operation, the display module can be connected via a cable provided in the VW3A58103 kit..

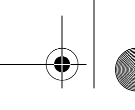
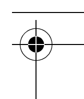
Access locking switch :

- position 🔒 : Settings and configuration not accessible
- position 🔒 : Settings accessible
- position 🔓 : Settings and configuration accessible



Practical Advice / Minimum Setup

Practical advice :

Before starting your programming, first fill in the configuration and settings record tables (at the end of this document).

Programming the Altivar 58 is made easier by the use of internal sequence selections and interlocks. In order to maximize this ease of use, we recommend that you access the menus in the following order. **Not all steps are essential in every case.**

LANGUAGE
MACRO-CONFIG
IDENTIFICATION
CONTROL (for 3-wire control only)
I/O
CONTROL
DRIVE
FAULT
COMMUNICATION or APPLICATION if a card is used
ADJUST



CAUTION : The user must ensure that the programmed functions are compatible with the wiring diagram used. This check is particularly important on the ready-assembled ATV58E if the factory configuration is modified; the diagram may also require modification.

Minimum setup :

This procedure can be used :
- in simple applications where the speed controller factory settings are suitable
- in installation phases where it is necessary to rotate the motor experimentally before undertaking a full installation

Procedure :

1 Follow the recommendations in the User's Manual supplied with the speed controller, most importantly setting the **50/60 Hz selector switch** to the nominal frequency of the motor.

2 Ensure that the factory macro-configuration is suitable, otherwise change it in the **«MACRO-CONFIG»** menu.

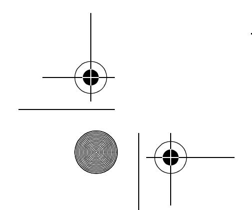
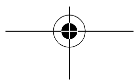
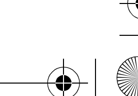
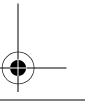
3 For speed controllers with power ratings greater than 7.5 kW at 200/240 V and 15 kW at 380/500 V in "standard torque" applications, configure the power in the **«IDENTIFICATION»** menu.

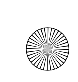
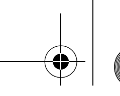
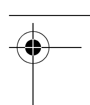
4 To ensure the required level of safety, check that the **wiring diagram is compatible** with the macro-configuration, otherwise modify the diagram.

5 Check in the **«DRIVE»** menu that the factory parameters are compatible with those given on the **motor rating plate**, otherwise modify them.

6 In the **«DRIVE»** menu, perform an auto tune.

7 If necessary, **adjust the parameters** in the **«ADJUST»** menu (ramps, thermal current, etc).


Unlocking Menus Before Programming

Level of access / Operating mode

The position of the selector switch offers three levels of access to the menus according to the operating phase of your machine. Access to the menus can also be locked using an access code (see the Files menu).

Position **Display :** use during operating phases

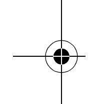
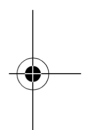
- LANGUAGE menu : To select the dialog language
- MACRO-CONFIG menu : To display the macro-configuration
- IDENTIFICATION menu : To display the speed controller voltage and power
- DISPLAY menu : To display the electrical values, the operating phase or a fault

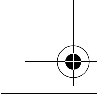
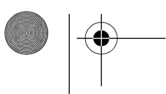
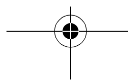
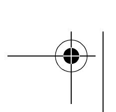
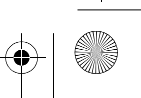
Position **Display and settings :** use during setup phases

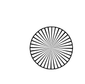
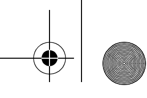
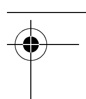
- To perform all the operations which are possible in **level 0**
- **ADJUST** menu : To set all the parameters which can be accessed while the motor is rotating

Position **Total unlock :** use during programming phases

- To perform all the operations which are possible in **levels 0 and 1**
- **MACRO-CONFIG** menu : To change the macro-configuration.
- **IDENTIFICATION** menu : To change the power in "standard torque" or "high torque" mode, for the ratings governed by this parameter.
- **DRIVE** menu : To adjust the performance of the motor-speed controller unit
- **CONTROL** menu : To configure control of the speed controller, for control via the terminals, the display module or the integrated RS485 serial link
- **I/O** menu : To change the I/O assignment
- **FAULT** menu : To configure the motor and speed controller protection and behavior in the event of a fault
- **FILES** menu : To save and restore the speed controller configurations stored in the display module, return to the factory settings or protect your configuration
- **COMMUNICATION** menu, if a communication card is installed : To adjust the parameters of a communication protocol
- **APPLICATION** menu, if a «client application» card is installed. Please refer to the documentation specific to this card.

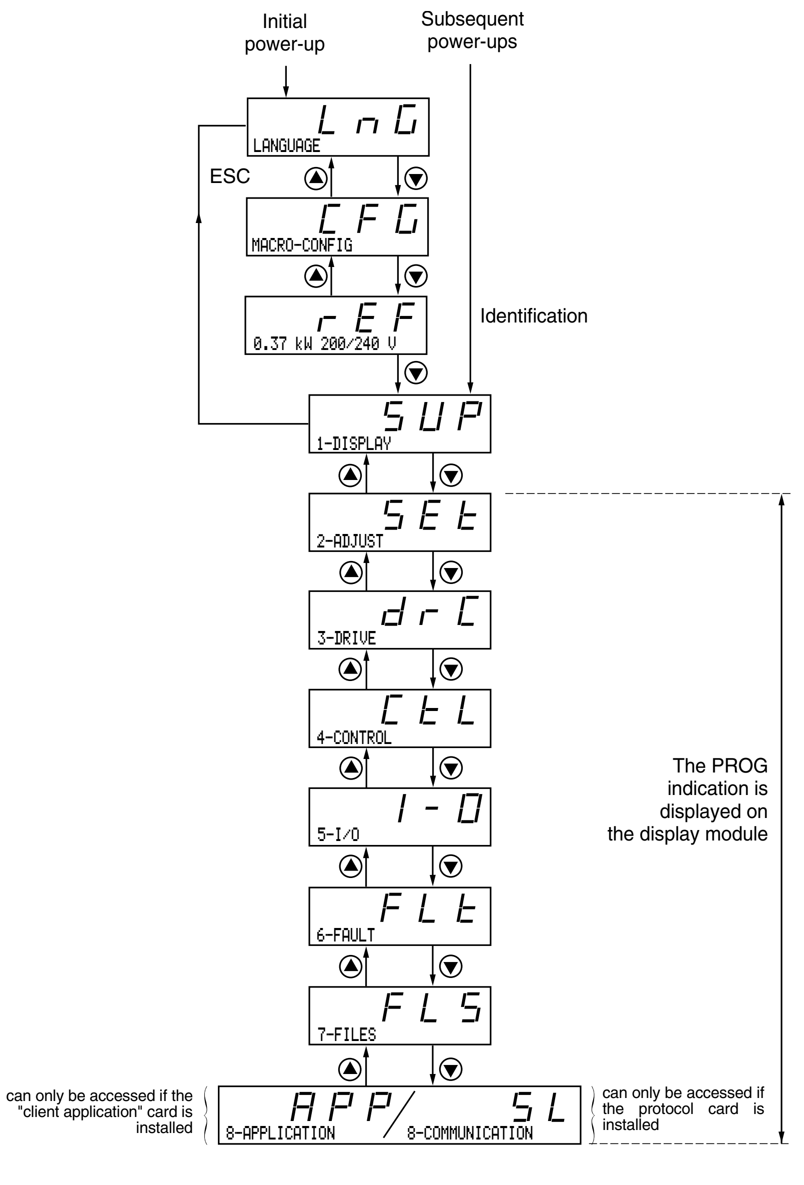



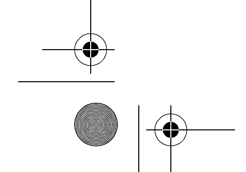
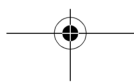
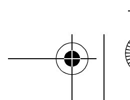
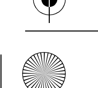




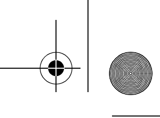
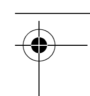
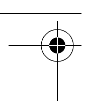
Access to Menus

The number of menus which can be accessed depends on the position of the access locking switch.
Each menu is made up of a number of parameters.



CAUTION : If an access code has already been programmed, it may be impossible to modify some menus, these may not even be visible. In this case, see the section entitled “FILES menu” explaining how to enter the access code.

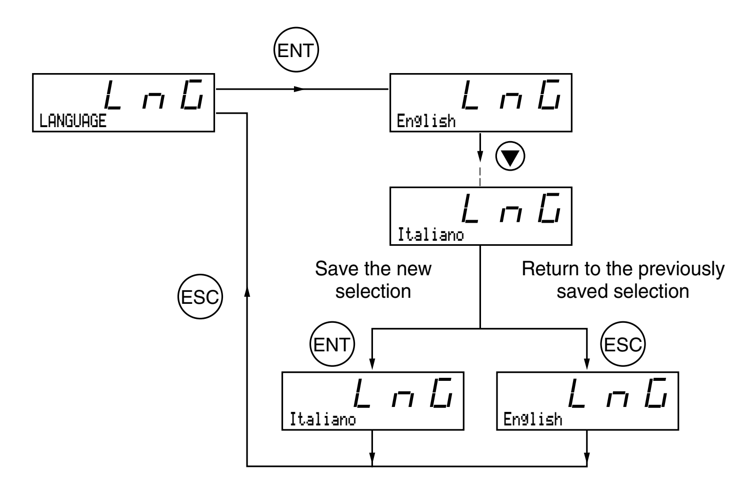




Access to Menus - Programming Principle

Language :

This menu can be accessed whatever position the access switch is in, and can be modified in stop or run mode.

Example :

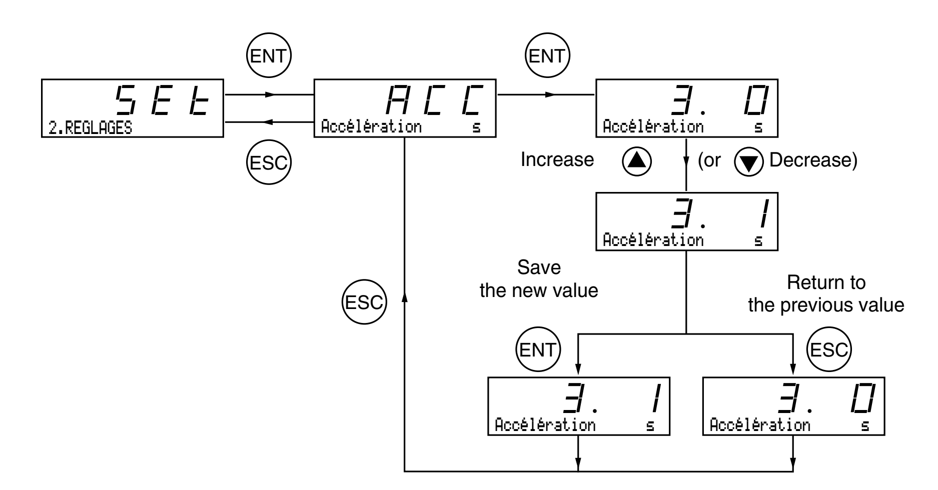


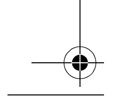
Possible selections : English (factory setting), French, German, Spanish, Italian.

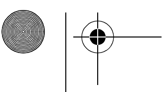
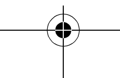
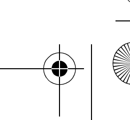
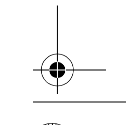
Programming principle :

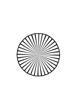
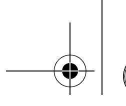
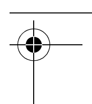
The principle is always the same, with 1 or 2 levels :

- 1 level : see the "language" example above.
- 2 levels : see the "acceleration ramp" example below.





Macro-Configurations

This parameter can always be displayed but can only be modified in programming mode (access switch in position) and in stop mode with the speed controller locked.

It can be used to automatically configure an application-specific function. Three application-specific functions are available.

- Handling (Hdg)
- Variable torque for pump and fan applications (VT)
- General use (GEn)

A macro-configuration automatically assigns the I/O and parameters, activating the functions required for the application. The parameters related to the programmed functions are available.

Factory setting : Handling

Speed controller :

I/O assignment according to the macro-configuration			
	Hdg : Handling	GEn : Gen Use.	VT : Var. Torque
Logic input LI1	forward	forward	forward
Logic input LI2	reverse	reverse	reverse
Logic input LI3	2 preset speeds	jog operation	reference switching
Logic input LI4	4 preset speeds	freewheel stop **(1)**	injection braking
Analog input AI1	summing ref.	summing ref.	speed ref. 1
Analog input AI2	summing ref.	summing ref.	speed ref. 2
Relay R1	controller fault	controller fault	controller fault
Relay R2	downstr. contactor ctrl	mot. therm. state reached	freq. setpoint reached
Analog output AO1	motor frequency	motor frequency	motor frequency

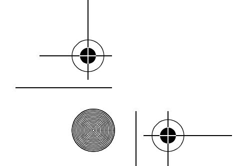
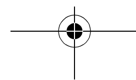
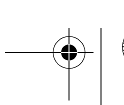
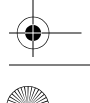
Extension cards :

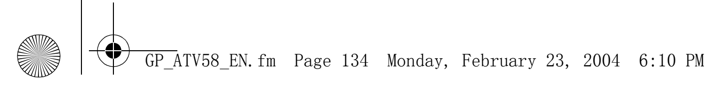
I/O assignment according to the macro-configuration			
	Hdg : Handling	GEn : Gen Use.	VT : Var. Torque
Logic input LI5	8 preset speeds	clear fault	freewheel stop **(1)**
Logic input LI6	clear fault	limit torque	ramp switching
Analog input AI3 or Inputs A, A+, B, B+	summing ref.	summing ref.	NO
	speed feedback	speed feedback	speed feedback
Logic output LO	current thresh reached	downstr. contactor ctrl	high speed reached
Analog output AO	Motor current	Motor current	Motor current

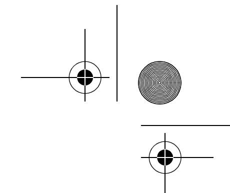
(1) In order to start, the logic input must be linked to the + 24 V (function active at 0).

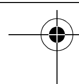


CAUTION : **Ensure that the programmed macro-configuration is compatible with the wiring diagram used**. This check is particularly important on the ready-assembled ATV58E if the factory configuration is modified; the diagram may also require modification.







Macro-Configurations

Modification of the macro-configuration requires double confirmation as it results in automatic assignment of functions and a return to factory settings.
The following screen is displayed :

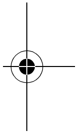
CH
WIRING OK? ENT

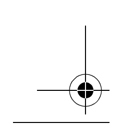
ENT to confirm the modification
ESC to return to the previous configuration

Customizing the configuration :

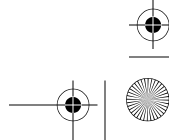
The configuration of the speed controller can be customized by changing the I/O assignment in the I/O menu which can be accessed in programming mode (access switch in position).
This customization modifies the displayed macro-configuration value :
is displayed.

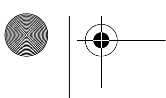


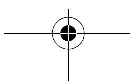


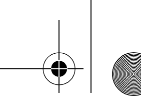


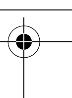


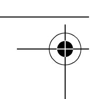












Drive Identification

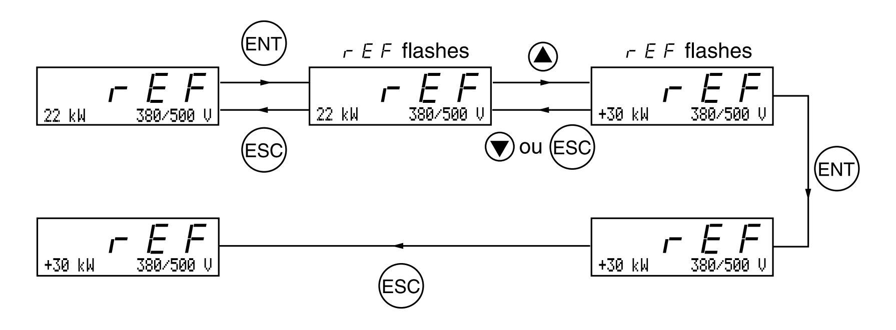
Drive identification

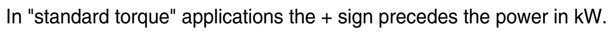
This parameter can always be displayed. It indicates the speed controller power and voltage as indicated on the identification label.

rEF 0.37 kW 200/240 V	The power is displayed in kW if the 50/60 Hz selector switch on the speed controller is set to 50 Hz, and in HP if it is set to 60 Hz.

For speed controllers rated above 7.5 kW at 200/240 V and 15 kW at 380/500 V :

The rating is different according to whether it is a standard torque or high torque application. The speed controllers are supplied factory set at "high torque". "Standard torque" configuration is obtained in the following way :



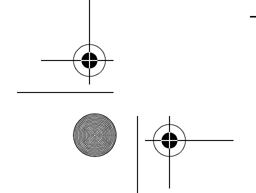


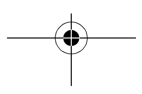
In "standard torque" applications the + sign precedes the power in kW.
To return to "high torque" configuration, perform the same procedure.
"Standard torque" or "high torque" configuration preconfigures the "factory setting" of certain parameters :

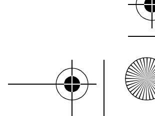
- Drive menu : UnS, nCr, nSP, COS, tUn
- Adjust menu : ItH, IdC.

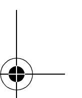


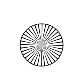
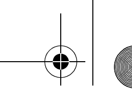
Changing from one to the other of these torque configurations therefore results in all these parameters returning to factory settings.

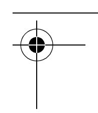








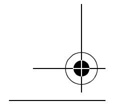
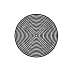
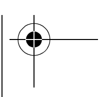
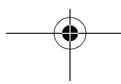
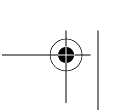
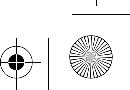


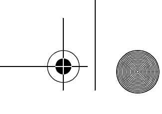
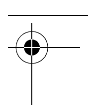
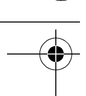

Display Menu

Display menu (selection of parameter displayed during operation)

The following parameters can be accessed whatever position the access switch is in, in stop or run mode.

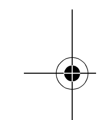
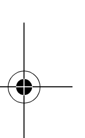
Code	Function	Unit
	Var. State	–
- - - rdY rUn ACC dEC CLI dCb nSt Obr	State of the speed controller : indicates a fault or the motor operating phase : rdY = speed controller ready, rUn = motor in steady state or run command present and zero reference, ACC = accelerating, dEC = decelerating, CLI = current limit, dCb = injection braking, nSt = freewheel stop control, Obr = braking by adapting the deceleration ramp (see the “drive” menu).	
FrH	Freq. Ref.	Hz
	Frequency reference	
rFr	Output Freq.	Hz
	Output frequency applied to the motor	
SPd	Motor Speed	rpm
	Motor speed estimated by the speed controller	
LCr	MotorCurrent	A
	Motor current	
USP	Mach. speed	–
	Machine speed estimated by the speed controller. This is proportional to rFr, according to a coefficient USC which can be regulated in the adjust menu. Displays a value corresponding to the application (metres / second, for example). Caution, if USP becomes greater than 9999 the display isdivided by 1000.	
OPr	Output power	%
	Power supplied by the motor, estimated by the controller. 100 % corresponds to nominal power.	
ULn	MainsVoltage	V
	Line voltage	
tHr	MotorThermal	%
	Thermal state : 100% corresponds to the nominal thermal state of the motor. Above 118%, the speed controller triggers an OLF fault (motor overload)	
tHd	DriveThermal	%
	Thermal state of the speed controller : 100% corresponds to the nominal thermal state of the speed controller. Above 118%, the speed controller triggers an OHF fault (speed controller overheating). It can be reset below 70 %.	
LFt	Last Fault	–
	Displays the last fault which occurred.	

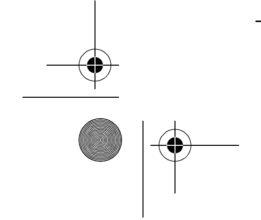
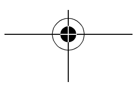
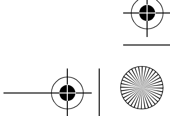







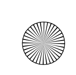
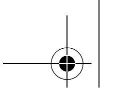




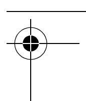
Display Menu

Code	Function	Unit
LFr	Freq. Ref.	Hz
	This adjustment parameter appears instead of the FrH parameter when the speed controller control via the display module is activated : LCC parameter in the control menu.	
APH	Consumption	kWh or MWh
	Energy consumed.	
rtH	Run time	hrs
	Continuous operating time (motor powered up) in hours.	





Adjust Menu



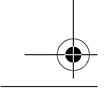
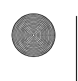
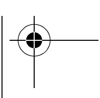
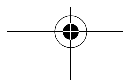
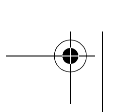
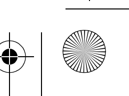
This menu can be accessed when the switch is in positions [locked] and [unlocked]. Adjustment parameters can be modified in stop mode OR during operation. **Ensure that any changes made during operation are not dangerous; changes should preferably be made in stop mode.**

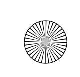
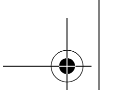
The list of adjustment parameters is made up of a fixed and a changeable part which varies according to :
- the selected macro-configuration
- the presence of an I/O extension card
- the reassignment of I/O

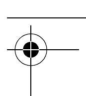
The following parameters can always be accessed in all the macro-configurations.

Code	Description	Adjustment range	Factory setting
LFr	Freq. Ref. - Hz	LSP to HSP	–
	Appears when control via the display module is activated : LCC parameter in the control menu		
ACC dEC	Acceleration - s Deceleration - s	0.05 to 999.9 0.05 to 999.9	3 s 3 s
	Acceleration and deceleration ramp times. Ranges 0 to motor nominal frequency (FrS)		
AC2 dE2	Accelerate 2 - s Decelerate 2 - s	0.05 to 999.9 0.05 to 999.9	5 s 5 s
	2nd acceleration ramp 2nd deceleration ramp These parameters can be accessed if the ramp switching threshold (parameter Frt) is other than 0 Hz or if a logic input is assigned to ramp switching.		
LSP	Low Speed - Hz	0 to HSP	0 Hz
	Low speed		
HSP	High Speed - Hz	LSP to tFr	50 / 60 Hz acc. to the switch
	High speed : ensure that this setting is correct for the motor and the application.		
FLG	Gain - %	0 to 100	20
	Frequency loop gain : used to adapt the rapidity of the machine speed transients according to the dynamics. For high resistive torque, high inertia or fast cycle machines, increase the gain gradually.		
StA	Stability - %	0 to 100	20
	Used to adapt the return to steady state after a speed transient according to the dynamics of the machine.Gradually increase the stability to avoid any overspeed.		
ItH	ThermCurrent - A	0.25 to 1.36 In (1)	According to controller rating
	Current used for motor thermal protection. Set ItH to the nominal current on the motor rating plate.		
tdC	DC Inj. Time - s	0 to 30 s Cont	0.5 s
	DC injection braking time. If this is increased to more than 30 s, "Cont" is displayed, permanent DC injection. The injection becomes equal to SdC after 30 seconds.		

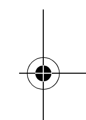
(1) In corresponds to the speed controller nominal current indicated in the catalog and on the speed controller identification label for high torque applications.

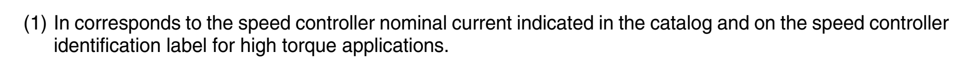







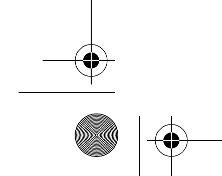
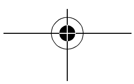
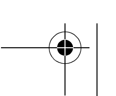
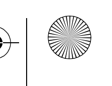


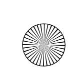
Code	Description	Adjustment range	Factory setting
SdC	DC stop.curr - A	0.1 to 1.36 In (1)	Acc. to contr. rating
	Injection braking current applied after 30 seconds if tdC = Cont. ⚠ Check that motor will withstand this curr. without overheating		
JPF	Jump Freq. - Hz	0 to HSP	0 Hz
	Skip frequency : prohibits prolonged operation over a frequency range of +/-2.5 Hz around JPF. This function can be used to prevent a critical speed which causes resonance.		
JF2	Jump Freq.2 - Hz	0 to HSP	0 Hz
	Second skip frequency: Same function as JPF, for a second frequency value		
JF3	Jump Freq.3 - Hz	0 to HSP	0 Hz
	Third skip frequency: Same function as JPF, for a third frequency value		
USC	Machine Coef.	0.01 to 100	1
	Coefficient applied to parameter rFr (output frequency applied to the motor), the machine speed is displayed via parameter USP USP = rFr x USC		
tLS	LSP Time - s	0 to 999.9	0 (no time limit)
	Operating time at low speed. After operating at LSP for a given time, the motor is stopped automatically. The motor restarts if the frequency reference is greater than LSP and if a run command is still present. Caution : value 0 corresponds to an unlimited time		

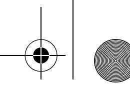
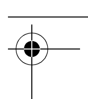
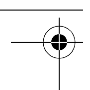




(1) In corresponds to the speed controller nominal current indicated in the catalog and on the speed controller identification label for high torque applications.

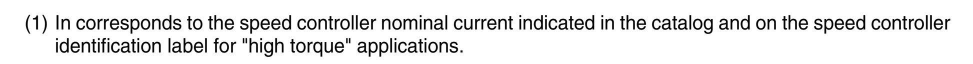


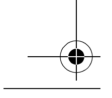
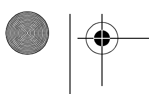
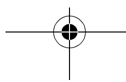
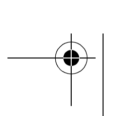
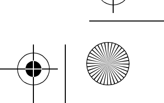
Adjust Menu

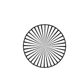
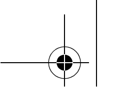
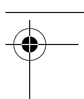
The following parameters can be accessed in the **'handling' macro-configuration**

Code	Description	Adjustment range	Factory setting
UFr	IR Compens. - %	0 to 150% or 0 to 800%	100%
	Used to adjust the default value or the value measured during auto-tuning. The adjustment range is extended to 800% if the SPC parameter (special motor) is set to "Yes" in the drive menu.		
SLP	Slip Comp. - %	0 to 150%	100%
	Used to adjust the slip compensation value fixed by the motor nominal speed.		
SP2	Preset Sp.2 - Hz	LSP to HSP	10 Hz
	2nd preset speed		
SP3	Preset Sp.3 - Hz	LSP to HSP	15 Hz
	3rd preset speed		
SP4	Preset Sp.4 - Hz	LSP to HSP	20 Hz
	4th preset speed		
SP5	Preset Sp.5 - Hz	LSP to HSP	25 Hz
	5th preset speed		
SP6	Preset Sp.6 - Hz	LSP to HSP	30 Hz
	6th preset speed		
SP7	Preset Sp.7 - Hz	LSP to HSP	35 Hz
	7th preset speed		
Ctd	Curr.Lev.Att - A	0 to 1.36 In (1)	1.36 In (1)
	Current threshold above which the logic output or the relay changes to 1		



(1) In corresponds to the speed controller nominal current indicated in the catalog and on the speed controller identification label for "high torque" applications.

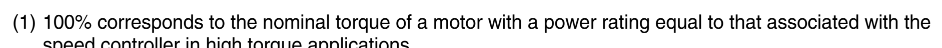

Adjust Menu

The following parameters can be accessed in the **'general use' macro-configuration**

Code	Description	Adjustment range	Factory setting
UFr	IR Compens. - %	0 to 150% or 0 to 800%	100%
	Used to adjust the default value or the measured value during auto-tuning. The adjustment range is extended to 800% if the SPC parameter (special motor) is set to "Yes" in the drive menu.		
SLP	Slip Comp. - %	0 to 150%	100%
	Used to adjust the slip compensation value fixed by the motor nominal speed.		
JOG	Jog Freq. - Hz	0 to 10 Hz	10 Hz
	Jog frequency		
JGt	JOG Delay - s	0 to 2 s	0.5 s
	Anti-repeat delay between two consecutive jog operations		
tL2	Trq.Limit 2 - %	0 to 200% (1)	200%
	Second torque limit level activated by a logic input		

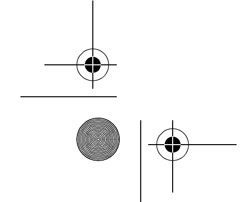
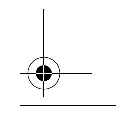
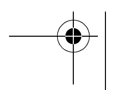
The following parameters can be accessed in the **'variable torque' macro-configuration**

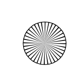
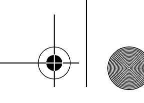
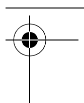
Code	Description	Adjustment range	Factory setting
IdC	DC Inj.curr - A	0.10 to 1.36 In (2)	Acc. to controller rating
	DC injection braking current. After 30 seconds the injection current is peak limited to 0.5 Ith if it is set at a higher value		
PFL	U/f Profile - %	0 to 100%	20%
	Used to adjust the quadratic power supply ratio when the energy saving function has been inhibited		



(1) 100% corresponds to the nominal torque of a motor with a power rating equal to that associated with the speed controller in high torque applications.
(2) In corresponds to the speed controller nominal current indicated in the catalog and on the speed controller identification label for "high torque" applications.

Parameters in gray boxes appear if an I/O extension card is installed

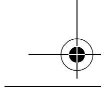
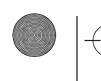
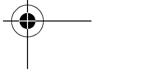
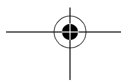
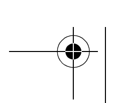
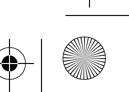


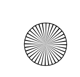
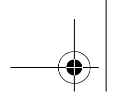
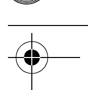
Adjust Menu

The following parameters can be accessed once the I/O have been reassigned on the basic product.

Code	Description	Adjustment range	Factory setting
AC2	Accel. 2 - s	0.05 to 999.9	5 s
	2nd acceleration ramp		
dE2	Decel. 2 - s	0.05 to 999.9	5 s
	2nd deceleration ramp These parameters can be accessed if the ramp switching time (parameter Frt) is other than 0 Hz or if a logic input is assigned to ramp switching.		
IdC	DC Inj.curr - A	0.10 to 1.36 In (1)	Acc. to controller rating
	DC injection braking current This parameter can be accessed if a logic input is assigned to DC injection stopping. After 30 seconds the injection current is peak limited to 0.5 Ith if it is set at a higher value		
SP2	Preset Sp.2 - Hz	LSP to HSP	10 Hz
	2nd preset speed		
SP3	Preset Sp.3 - Hz	LSP to HSP	15 Hz
	3rd preset speed		
SP4	Preset Sp.4 - Hz	LSP to HSP	20 Hz
	4th preset speed		
SP5	Preset Sp.5 - Hz	LSP to HSP	25 Hz
	5th preset speed		
SP6	Preset Sp.6 - Hz	LSP to HSP	30 Hz
	6th preset speed		
SP7	Preset Sp.7 - Hz	LSP to HSP	35 Hz
	7th preset speed		
JOG	Jog Freq. - Hz	0 to 10 Hz	10 Hz
	Jog frequency		
JGt	JOG Delay - s	0 to 2 s	0.5 s
	Anti-BrkLgSeqFlwd delay between two consecutive jog operations		
brL	BrReleaseLev- Hz	0 to 10 Hz	0 Hz
	Brake release frequency		
Ibr	BrRelease I - A	0 to 1.36In(1)	0 A
	Brake release current		
brt	BrReleasTime- s	0 to 5 s	0 s
	Brake release time		
bEn	BrEngage Lev- Hz	0 to LSP	0 Hz
	Brake engage frequency		
bEt	BrEngageTime- Hz	0 to 5 s	0 s
	Brake engage time		

(1) In corresponds to the speed controller nominal current indicated in the catalog and on the speed controller identification label for "high torque" applications.

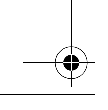
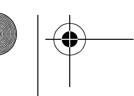
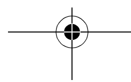
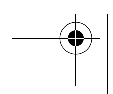
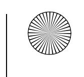

GP_ATV58_EN.fm Page 143 Monday, February 23, 2004 6:10 PM

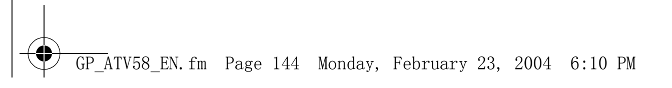
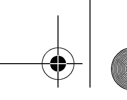
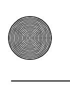
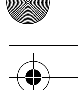
Code	Description	Adjustment range	Factory setting
FFt	TripThreshNST-Hz	0 to HSP	0 Hz
	Freewheel stop trip threshold: When a stop on ramp or fast stop is requested, the type of stop selected is activated until the speed falls below this threshold. Below this threshold, freewheel stop is activated. This parameter can only be accessed if the R2 relay is not assigned to the "BLC: Brake Logic" function, and if an "on ramp" or "fast" type stop has been selected in the drive menu.		
bIP	Brake impul.	No - Yes	No
	Brake release pulse Yes : While the brake is released the torque is always in the FW (foward) control corresponds to the direction, regardless of the direction requested. ⚠ Check that the motor torque direction for FW (foward) control corresponds to the direction of increase in load; if necessary reverse 2 motor phases. no : while the brake is released the torque is in the requested direction of rotation.		
dtS	Tacho Coeff.	1 to 2	1
	Multiplication coefficient of the feedback associated with tachogenerator function : $dtS = \frac{9}{\text{tacho voltage at HSP HSP}}$		
rPG	PI Prop.Gain	0.01 to 100	1
	Proportional gain of the PI regulator		
rIG	PI Int.Gain	0.01 to 100/s	1 / s
	Integral gain of the PI regulator		
FbS	PI Coeff.	1 to 100	1
	PI feedback multiplication coefficient		
PIC	PI Inversion	No - Yes	No
	Reversal of the direction of correction of the PI regulator no : normal yes : reverse		
Ftd	Freq.Lev.Att- Hz	LSP to HSP	50/60 Hz
	Motor frequency threshold above which the logic output changes to 1		
F2d	Freq.Lev.2 - Hz	LSP to HSP	50/60 Hz
	Same function as Ftd, for a second frequency value		
Ctd	Curr.Lev.Att- A	0 to 1.36 In (1)	1.36 In (1)
	Current threshold above which the logic output or the relay changes to 1		
ttd	ThermLev.Att- %	0 to 118%	100%
	Motor thermal state threshold above which the logic output or the relay changes to 1		
tL2	Trq.Limit 2 - %	0 to 200% (2)	200%
	Second torque limit level activated by a logic input		

(1) In corresponds to the speed controller nominal current indicated in the catalog and on the speed controller identification label for "high torque" applications.
(2) 100% corresponds to the nominal torque of a motor with a power rating equal to that associated with the speed controller for "high torque" applications.

Parameters in gray boxes appear if an I/O extension card is installed

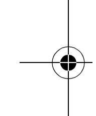
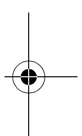


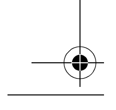
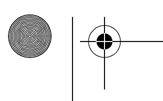
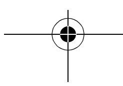
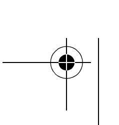
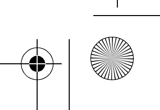






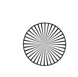
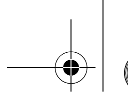
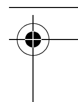






Adjust Menu

Code	Description	Adjustment range	Factory setting
PSP	PI Filter - s	0,0 à 10,0	0 s
	Adjusts the time constant of the filter on the return PI		
P I2	PI Preset 2 - %	0 à 100 %	30 %
	2nd preset reference of PI when a logic input has been assigned to 4 preset speeds. 100 % = maxi process 0 % = mini process		
P I3	PI Preset 3 - %	0 à 100 %	60 %
	3rd preset reference of PI when a logic input has been assigned to 4 preset speeds. 100 % = maxi process 0 % = mini process		
dtd	ATV Th. fault	0 à 118 %	105 %
	Level of drive thermal state above which the logic output or relay change to state 1.		



Drive Menu

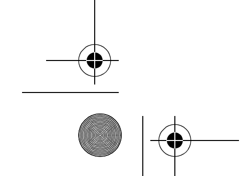
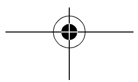
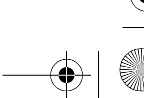
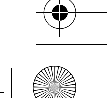
This menu can be accessed when the switch is in position .
The parameters can only be modified in stop mode with the speed controller locked.

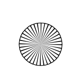
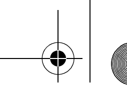
Drive performance can be optimized by :
- **entering the values given on the rating plate in the drive menu**
- **performing an auto-tune operation (on a standard asynchronous motor)**

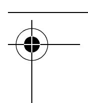
When using special motors (motors connected in parallel, tapered rotor brake motors, synchronous or synchronized asynchronous motors, rheostatic rotor asynchronous motors)þ:
- Select the “Hdg : Handling” or the “GEn : General Use” macro-configuration.
- Set the “SPC” Special motor parameter to “Yes” in the drive menu.
- Adjust the “UFr” IR compensation parameter in the adjust menu to obtain satisfactory operation.

Code	Description	Adjustment range	Factory setting
UnS	Nom.Mot.Volt - V	200 to 240V 200 to 500 V	230 V (2) 400/460V (2)
	Nominal motor voltage given on the rating plate The adjustment range depends on the speed controller model : ATV58••••M2 ATV58••••N4		
FrS	Nom.Mot.Freq- Hz	10 to 500 Hz	50/60Hz (2)
	Nominal motor frequency given on the rating plate		
nCr	Nom.Mot.Curr - A	0.25 to 1.36 In (1)	acc. to controller rating
	Nominal motor current given on the rating plate		
nSP	Nom.MotSpeed-rpm	0 to 9999 rpm	acc. to controller rating
	Nominal motor speed given on the rating plate		
COS	Mot. Cos Phi	0.5 to 1	acc. to controller rating
	Motor Cos Phi given on the rating plate		
tUn	Auto Tuning	No - Yes	No
	Used to auto-tune motor control once this parameter has been set to “Yes”. Once auto-tuning is complete, the parameter automatically returns to “Done”, or to “No” in the event of a fault. Caution : auto-tuning is only performed if no command has been activated. If a "freewheel stop" or "fast stop" function is assigned to a logic input, this input must be set to 1 (active at 0).		
tFr	Max. Freq. - Hz	10 to 500 Hz	60/72Hz (2)
	Maximum output frequency. The maximum value is a function of the switching frequency. See SFR parameter (drive menu).		
nLd	Energy Eco	No-Yes	Yes
	Optimizes motor efficiency. Can only be accessed in the variable torque macro-configuration.		

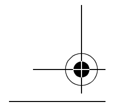
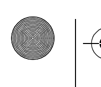
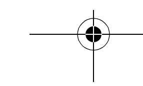
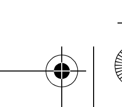
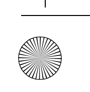
(1) In corresponds to the speed controller nominal current indicated in the catalog and on the speed controller identification label for "high torque" applications.
(2) according to position of 50/60Hz switch.

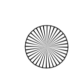
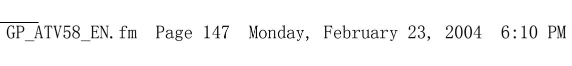





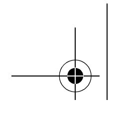
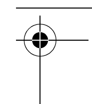





Code	Description	Adjustment range	Factory setting
Fdb	I lim. Adapt	No-Yes	No
	Adaptation of the current limit according to the output frequency. This parameter only appears in the "variable torque" VT macro-configuration (ventilation applications where the load curve changes according to the density of the gas).		
brA	DecRampAdapt	No-Yes	No
	Activation of this function is used to increase the deceleration time automatically if this has been set to too low a value for the inertia of the load, thus avoiding an ObF fault. This function may be incompatible with positioning on a ramp and with the use of a braking resistor. The factory setting depends on the macro-configuration used : No for handling, Yes for variable torque and general use. If relay R2 is assigned to the brake sequence function, the parameter brA remains locked on No.		
Frt	SwitchRamp2- Hz	0 to HSP	0 Hz
	Ramp switching frequency. Once the output frequency exceeds Frt, the ramp times taken into account are AC2 and dE2.		
Stt	Type of stop	STN - FST - NST - DCI	STN
	Type of stop: When a stop is requested, the type of stop is activated until the Ftt threshold (adjust menu) is reached. Below this threshold, freewheel stop is activated. Stn: On ramp Fst: Fast stop Nst: Freewheel stop Dci: DC injection stop This parameter cannot be accessed if the R2 relay is assigned to the “BLC: Brake Logic” function.		
rPt	Ramp Type	LIN - S - U	LIN
	Defines the shape of the acceleration and deceleration ramps. LIN : linear S : S-shape ramp U : U-shape ramp S-shape ramps: The curve coefficient is fixed, with t2 = 0.6 x t1 with t1 = set ramp time. U-shape ramps: The curve coefficient is fixed, with t2 = 0.5 x t1 with t1 = set ramp time.		
dCF	DecRAmpCoeff	1 to 10	4
	Deceleration ramp time reduction coefficient when the fast stop function is active.		

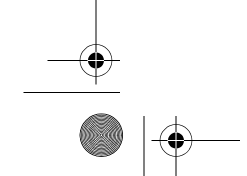
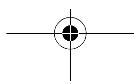
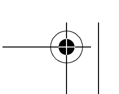
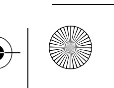






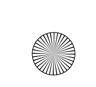
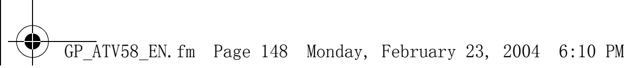



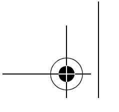
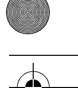
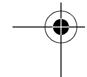



Code	Description	Adjustment range	Factory setting
tLI	Trq.Limit _ %	0 to 200% (1)	200%
	The torque limit is used to limit the maximum motor torque.		
CLI	nt. I Lim - A	0 to 1.36 In (2)	1.36 In
	The current limit is used to limit motor overheating.		
AdC	Auto DC Inj.	No-Yes	Yes
	Used to deactivate automatic DC injection braking on stopping.		
PCC	Motor P Coef	0.2 to 1	1
	Defines the relationship between the speed controller nominal power and a less powerful motor when a logic input has been assigned to the motor switching function.		
SFt	Sw Freq. Type	LF-HF1-HF2	LF
	Used to select a low switching frequency (LF) or a high switching frequency (HF1 or HF2). HF1 switching is designed for applications with a low load factor without derating the speed controller. If the thermal state of the speed controller exceeds 95þ%, the frequency automatically changes to 2 or 4 kHz depending on the speed controller rating. When the thermal state of the speed controller drops back to 70 %, the selected switching frequency is re-established. HF2 switching is designed for applications with a high load factor with derating of the speed controller by one rating : the drive parameters are scaled automatically (torque limit, thermal current, etc). ⚠ **Modifying this parameter results in the following parameters returning to factory settings :** **• nCr, CLI, Sfr, nrd (Drive menu)** **• ItH, IdC, Ibr, Ctd (Adjust menu).**		
SFr	Sw Freq. - kHz	0.5-1-2-4-8-12-16 kHz	acc. to controller rating
	Used to select the switching frequency. The adjustment range depends on the SFt parameter. If SFt = LF : 0.5 to 2 or 4 kHz acc. to the controller rating If SFt = HF1 or HF2 : 2 or 4 to 16 kHz acc. to the controller rating The maximum operating frequency (tFr) is limited according to the switching frequency : SFr(kHz) 0.5 1 2 4 8 12 16 tFr (Hz) 62 125 250 500 500 500 500		
nrd	Noise Reduct	No-Yes	(3)
	This function modulates the switching frequency randomly to reduce motor noise.		
SPC	Special motor	No-Yes	No
	This function with "yes" extends the adjustment range for the UFr parameter in the adjust menu for adaptation to the special motors mentioned at the start of this section. Can only be accessed in the "Handling" and "General use" macro-configurations. NO : normal motor YES : special motor PSM : small motor		

(1) 100% corresponds to the nominal torque of a motor with a power rating equal to that associated with the speed controller for "high torque" applications.
(2) In corresponds to the speed controller nominal current indicated in the catalog and on the speed controller identification label for "high torque" applications.
(3) Yes if SFt = LF, No if SFt = HF1 or HF2

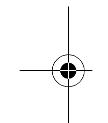
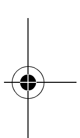
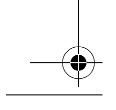



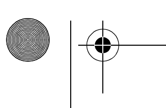
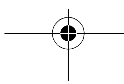
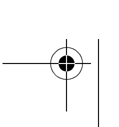
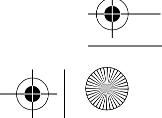




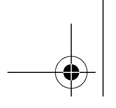
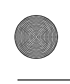
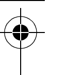
Drive Menu

Code	Description	Adjustment range	Factory setting
PGt	PG Type	INC-DET	DET
	Defines the type of sensor used when an encoder feedback I/O card is installed : INC : incremental encoder (A, A+, B, B+ are hard-wired) DET : detector (only A is hard-wired)		
PLS	Num. Pulses	1 to 1024	1024
	Defines the number of pulses for one rotation of the encoder.		

Parameters in gray boxes appear if an I/O extension card is installed

Control Menu

This menu can be accessed when the switch is in position 🔓. The parameters can only be modified in stop mode with the speed controller locked.

Code	Description	Adjustment range	Factory setting
tCC	TermStripCon	2W- 3W (2-wire/ 3-wire)	2W

Configuration of terminal control : 2-wire or 3-wire control.

⚠ Modification of this parameter requires double confirmation as it results in reassignment of the logic inputs. By changing from 2-wire control to 3-wire control, the logic input assignments are shifted by one input. The LI3 assignment in 2-wire control becomes the LI4 assignment in 3-wire control. In 3-wire control, inputs LI1 and LI2 cannot be reassigned.

I/O	Handling	General use	Variable torque
LI1	STOP	STOP	STOP
LI2	RUN forward	RUN forward	RUN forward
LI3	RUN reverse	RUN reverse	RUN reverse
LI4	2 preset speeds	jog operation	ref. switching
LI5	4 preset speeds	freewheel stop	injection braking
LI6	8 preset speeds	clear faults	freewheel stop

The I/O with a gray background can be accessed if an I/O extension card has been installed.
3-wire control (pulse control : one pulse is sufficient to control start-up). This option inhibits the "automatic restart" function.

Wiring example :
LI1 : stop
LI2 : forward
LIx : reverse

ATV58 control terminals
24 V LI1 LI2 LIx

This option only appears if 2-wire control is configured.

Code	Description	Adjustment range	Factory setting
tCt	Type 2 Wire	LEL-TRN-PFo	LEL

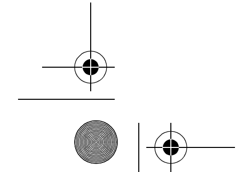
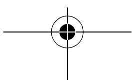
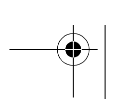
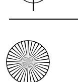
Defines 2-wire control :

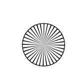
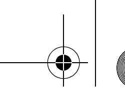
- according to the state of the logic inputs (LEL : 2-wire)
- according to a change in state of the logic inputs (TRN : 2-wire trans.)
- according to the state of the logic inputs with forward always having priority over reverse (PFo : Priorit. FW)

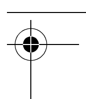
Wiring example :
LI1 : forward
LIx : reverse

ATV58 control terminals
24 V LI1 LIx

Parameters in gray boxes appear if an I/O extension card is installed

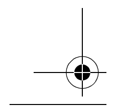
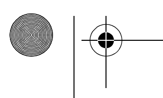
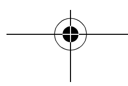
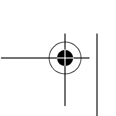
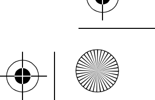



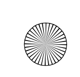
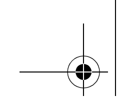
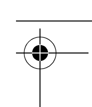




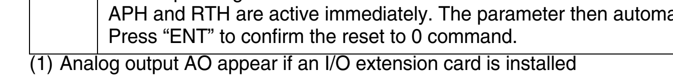
Control Menu

Code	Description	Adjustment range	Factory setting
rIn	RV Inhib.	No - Yes	No
	• Inhibition of operation in the opposite direction to that controlled by the logic inputs, even if this reversal is required by a summing or process control function. • Inhibition of reverse if it is controlled by the FWD/REV key on the display module.		
bSP	deadb./pedst	No BNS:Pedestal BLS:Deadband	No
	Management of operation at low speed :		
CrL CrH	AI2 min Ref.- mA AI2 Max. Ref- mA	0 to 20 mA 4 to 20 mA	4 mA 20 mA
	Minimum and maximum value of the signal on input AI2. These two parameters are used to define the signal sent to AI2. There are several configuration possibilities, one of which is to configure the input for a 0-20 mA, 4-20 mA, 20-4mA, etc signal.		

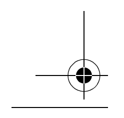






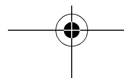
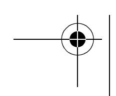
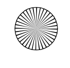





GP_ATV58_EN.fm Page 151 Monday, February 23, 2004 6:10 PM

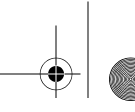
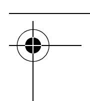
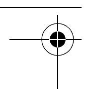
Code	Description	Adjustment range	Factory setting
AOL AOH	AO Min. Val- mA AO Max. Val- mA	0 to 20 mA 0 to 20 mA	0 mA 20 mA
	Parameter / Max / 0 / AOL / AOH / 20 / AO (graph)	Min. and max. value of the signal on output AO and AO1 (1). These two parameters are used to define the output signal on AO and AO1. Eg. : 0-20 mA, 4-20 mA, 20-4mA, etc	
Str	Save Ref.	NO-RAM-EEP	NO
	Associated with the +/- speed function, this function is used to save the reference : when the run commands disappear (save in RAM) or when the line supply disappears (save in EEPROM) On the next start-up, the speed reference is the last reference saved.		
LCC	Keypad Comm.	No-Yes	No
	Used to activate speed controller control via the display module. The STOP/RESET, RUN and FWD/REV keys are active. The speed reference is given by the parameter LFr. Only the freewheel stop, fast stop and DC injection stop commands remain active at the terminals. If the speed controller / display module connection is cut, the speed controller locks in an SLF fault.		
PSt	STOP Priorit	No-Yes	Yes
	This function gives priority to the STOP key irrespective of the control channel (terminals or fieldbus). To set the PSt parameter to "No" : 1 - Display "No". 2 - Press the "ENT" key. 3 - The speed controller displays "See manual" 4 - Press ▲ then ▼ then "ENT". For applications with continuous processes, it is advisable to configure the key as inactive (set to "No").		
Add	DriveAddress	0 to 31	0
	Address of the speed controller when it is controlled via the display module port (with the display module and programming terminal removed)		
tbr	BdRate RS485	9600-19200	19200
	Transmission speed via the RS485 serial link (effective on the next power-up) 9600 bps 19200 bps  **If tbr ≠ 19200, the terminal can no longer be used. To reactivate the terminal, reconfigure tbr as 19200 via the serial link or revert to factory settings (see page 127).**		
rPr	Reset counters	No-APH-RTH	No
	KWh or operating time reset to 0 No: No APH: KWh reset to 0 RTH: Operating time reset to 0 APH and RTH are active immediately. The parameter then automatically returns to NO. Press “ENT” to confirm the reset to 0 command.		

(1) Analog output AO appear if an I/O extension card is installed





I/O Menu

This menu can be accessed when the switch is in position .
The assignments can only be modified in stop mode with the speed controller locked.

Code	Function
L I2	LI2 Assign.
	See the summary table and description of the functions

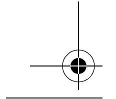
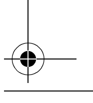
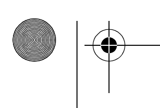
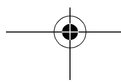
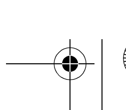
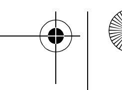
The inputs and outputs available in the menu depend on the I/O cards installed (if any) in the speed controller, as well as the selections made previously in the control menu.
The “factory” configurations are preassigned by the selected macro-configuration.

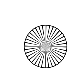
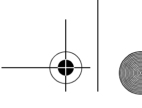
Summary table of the configurable input assignments (exc. 2-wire / 3-wire option)

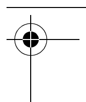
I/O extension option cards		2 logic inputs LI5-LI6
Speed controller without option		3 logic inputs LI2 to LI4
NO:Not assigned	(Not assigned)	X
RV :Reverse	(Run reverse)	X
RP2:Switch Ramp2	(Ramp switching)	X
JOG	(Jog operation)	X
+SP: + Speed	(+ speed)	X
-SP: - Speed	(- speed)	X
PS2: 2 Preset SP	(2 preset speeds)	X
PS4: 4 Preset SP	(4 preset speeds)	X
PS8: 8 Preset SP	(8 preset speeds)	X
RFC:Auto/manu	(Reference switching)	X
NST:Freewhl Stop	(Freewheel stop)	X
DCI:DC inject.	(Injection stop)	X
FST:Fast stop	(Fast stop)	X
CHP:Multi. Motor	(Motor switching)	X
TL2:Trq.Limit 2	(Second torque limit)	X
FLO:Forced Local	(Forced local mode)	X
RST:Fault Reset	(Clearing faults)	X
ATN:Auto-tune	(Auto-tuning)	X
PAU:PI Auto/Manu	(PI Auto/Manu) If one AI = PIF	X
PR2:PI 2 Preset	(2 preset PI setpoints) If one AI = PIF	X
PR2:PI 4 Preset	(4 preset PI setpoints) If one AI = PIF	X
TLA:Torque limit	(Torque limitation by AI) If one AI = ATL	X
EDD:Ext flt.	(external fault)	X



CAUTION: If a logic input is assigned to "Freewheel stop" or "Fast stop", start-up can only be performed by linking this input to the +24V, as these stop functions are active when inputs are at state 0.




I/O Menu

Summary table of the configurable input and encoder assignment

I/O extension option cards			Analog input AI3	Encoder input (1) A+, A-, B+, B-
Speed controller without option		Analog input AI2		
NO:Not assigned	(Not assigned)	X	X	X
FR2:Speed Ref2	(Speed reference 2) If one LI = RFC	X		
SAI:Summed Ref.	(Summing reference)	X	X	X
PIF:PI Regulator	(PI regulator feedback)	X	X	
PIM:PI Man.ref.	(Manual PI speed reference) If one AI = PIF and one LI = PAU	X		
SFB:Tacho feedbk	(Tachogenerator)		X	
PTC:Therm.Sensor	(PTC probes)		X	
ATL:Torque Lim.	(Torque limit)		X	
RGI:PG feedbk	(Encoder or sensor feedback)			X

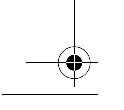
(1) NB : The menu for assigning encoder input A+, A-, B+, B- is called "Assign AI3".

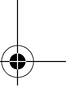
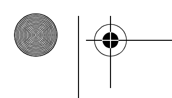
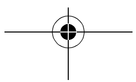
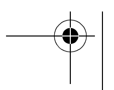


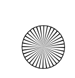
CAUTION : If relay R2 is assigned to the "brake sequence" function, AI3 is automatically assigned in the factory setting to Tacho Feedback, if the card is present. However, it is still possible to reassign AI3.

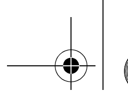
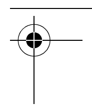
Summary table for configurable outputs

I/O extension option card			Logic output LO
Speed controller without option		Relay R2	
NO:Not assigned	(Not assigned)	X	X
RUN:DriveRunning	(Speed controller running)	X	X
OCC:OutputCont.	(Downstream contactor control)	X	X
FTA:Freq Attain.	(Threshold freq. reached)	X	X
FLA:HSP Attained	(HSP reached)	X	X
CTA:I Attained	(Current threshold reached)	X	X
SRA:FRH Attained	(Frequency reference reached)	X	X
TSA:MtrTherm Lvl	(Motor thermal threshold reached)	X	X
BLC:Brk Logic	(Brake sequence)	X	
APL:4-20 mA loss	(Loss of 4-20 mA signal)	X	X
F2A:F2 Attained	(Second frequency threshold reached)	X	X
TAD:ATV th. Alarm	(Drive thermal threshold reached)	X	X





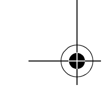
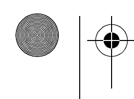
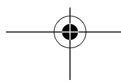
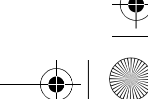
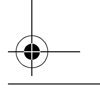
I/O Menu

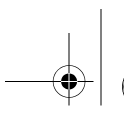
Table of the analogue output assignments

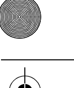
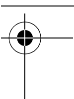
I/O extension option cards		Analog output AO
Speed controller without option		**Analog output AO1**
NO :Not assigned	(Not assigned)	X
OCR:Motor Curr.	(Motor current)	X
OFR:Motor Freq	(Motor speed)	X
ORP:Output ramp	(Ramp output)	X
TRQ:Motor torque	(Motor torque)	X
STQ:Signed Torq.	(Signed motor torque)	X
ORS:Signed ramp	(Signed ramp output)	X
OPS:PI ref.	(PI setpoint output) If one AI = PIF	X
OPF:PI Feedback	(PI feedback output) If one AI = PIF	X
OPE:PI Error	(PI error output) If one AI = PIF	X
OPI:PI Integral	(PI integral output) If one AI = PIF	X
OPR:Motor power	(Motor power)	X
THR:Motor Thermal	(Motor thermal state)	X
THD:Drive Thermal	(Drive thermal state)	X

Once the I/O have been reassigned, the parameters related to the function automatically appear in the menus, and the macro-configuration indicates “CUS : Customize”.
Some reassignments result in new adjustment parameters which the user must not forget to set in the adjust menu :

I/O		Assignments	Parameters to set
LI	RP2	Ramp switching	AC2 dE2
LI	JOG	Jog operation	JOG JGt
LI	PS4	4 preset speeds	SP2 - SP3
LI	PS8	8 preset speeds	SP4 - SP5 - SP6 - SP7
LI	DCI	Injection stop	IdC
LI	TL2	Second torque limit	tL2
LI	PR4	4 preset PI setpoints	PI2 - PI3
AI	PIF	PI regulator	rPG - rIG - PIC - rdG - rEO - PrG - PSr - PSP - PLr - PLb
AI	SFB	Tachogenerator	dtS
R2	BLC	Brake sequence	Ibr - brt - bEn - bEt - brL - bIP
LO/R2	FTA	Frequency threshold reached	Ftd
LO/R2	CTA	Current threshold reached	Ctd
LO/R2	TSA	Motor thermal threshold reached	ttd
LO/R2	F2A	2 nd frequency threshold reached	F2d
LO/R2	TAD	Drive thermal threshold reached	dtd

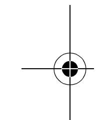
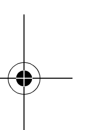


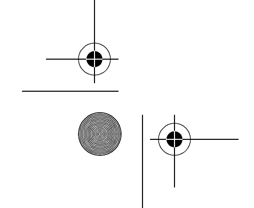
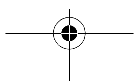
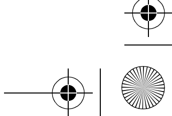



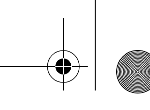
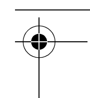
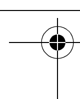

I/O Menu

Some reassignments result in new adjustment parameters being added which the user must configure in the control, drive or fault menu :

I/O	Assignments		Parameters to set
LI	-SP	- speed	Str (control menu)
LI	FST	Fast stop	dCF (drive menu)
LI	RST	Fault reset	rSt (fault menu)
AI	SFB	Tachogenerator	Sdd (fault menu)
A+, A-, B+, B-	SAI	Summing reference	PGt, PLS (drive menu)
A+, A-, B+, B-	RGI	PG Feedback	PGt, PLS (drive menu)

Configurable I/O Application Functions

Function compatibility table

The choice of application functions may be limited by incompatibility between certain functions. Functions which are not listed in this table are fully compatible.

	DC injection braking	Summing inputs	PI regulator	+ / - speed	Reference switching	Freewheel stop	Fast stop	Jog operation	Preset speeds	Speed regulation with tachogenerator or encoder	Torque limitation via AI3	Torque limitation via LI
DC injection braking						↑						
Summing inputs					●							
PI regulator								●	●	●		
+ / - speed					●			↑	●			
Reference switching		●		●					●			
Freewheel stop	←						←					
Fast stop						↑						
Jog operation			●	←					←			
Preset speeds			●	●	●			↑				
Speed regulation with tachogenerator or encoder			●									
Torque limitation via AI3												●
Torque limitation via LI											●	

● Incompatible functions

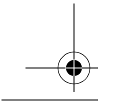
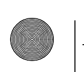
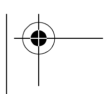
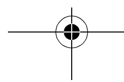
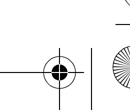
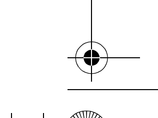
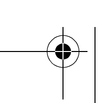
(blank) Compatible functions

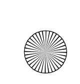
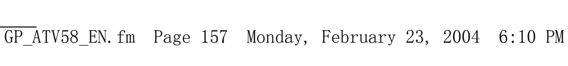
(shaded) Not applicable

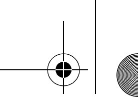
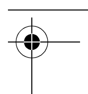
Priority functions (functions which cannot be active simultaneously) :

← ↑ The function indicated by the arrow has priority over the other.

Stop functions have priority over run commands.
Speed references via logic command have priority over analog setpoints.

Configurable I/O Application Functions

Logic input application functions

Operating direction : forward / reverse
Reverse operation can be disabled for applications requiring only a single direction of motor rotation.

2-wire control
Run and stop are controlled by the same logic input, for which state 1þ(run) or 0 (stop), or a change in state is taken into account (see the 2-wire control menu).

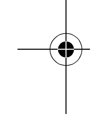
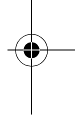
3-wire control
Run and stop are controlled by 2 different logic inputs. LI1 is always assigned to the stop function. A stop is obtained on opening (state 0).

The pulse on the run input is stored until the stop input opens.

During power-up or manual or automatic fault resetting, the motor can only be supplied with power after a reset prior to the “forward”, “reverse”, and “injection stop” commands.

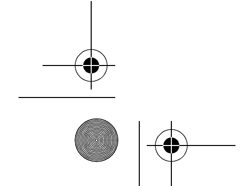
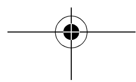
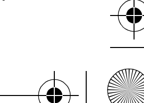
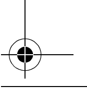
Ramp switching : 1st ramp : ACC, DEC ; 2nd ramp : AC2, DE2
Two types of activation are possible :
activation of logic input LIx
detection of an adjustable frequency threshold

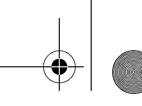
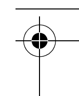
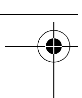
If a logic input is assigned to the function, ramp switching can only be performed by this input.

Step by step operation (“JOG”) : Low speed operation pulse
If the JOG contact is closed and then the operating direction contact is actuated, the ramp is 0.1þs irrespective of the ACC, dEC, AC2, dE2 settings. If the direction contact is closed and the JOG contact is then actuated, the configured ramps are used.

Parameters which can be accessed in the adjust menu :
- JOG speed
- anti-repeat delay (minimum time between 2 “JOG” commands).

Configurable I/O Application Functions

+ / - speed : 2 types of operation are available
1 Use of single action buttons : two logic inputs are required in addition to the operating direction(s). The input assigned to the "+ speed" command increases the speed, the input assigned to the "- speed" command decreases the speed.

This function accesses the Str save reference parameter in the Control menu.

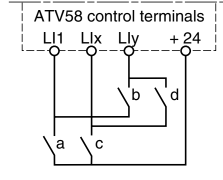
2 Use of double action buttons : only one logic input assigned to + speed is required.
+ / - speed with double action buttons :

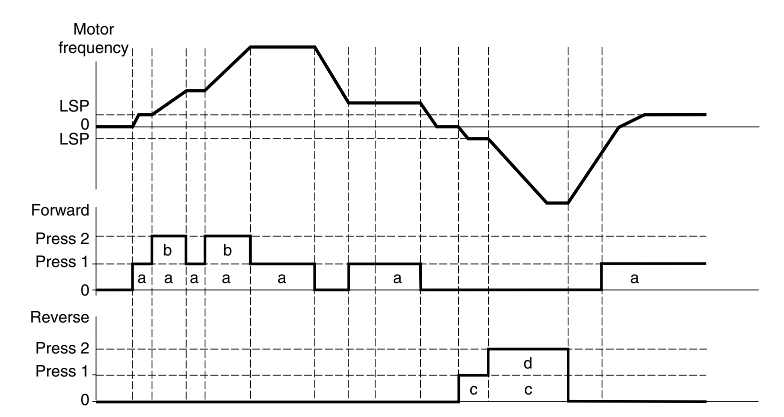
Description : 1 button pressed twice for each direction of rotation.
Each action closes a volt-free contact.

	Release (- speed)	Press 1 (speed maintained)	Press 2 (+ speed)
forward button	–	a	a and b
reversebutton	–	c	c and d

Wiring example :

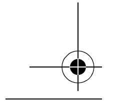
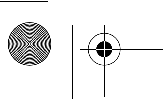
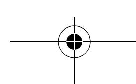
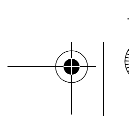
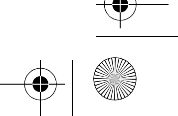
LI1 : forward
LIx : reverse
LIy : + speed

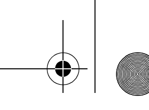
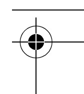
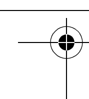




This type of +/- speed is incompatible with 3-wire control. In this case, the - speed function is automatically assigned to the logic input with the highest index (for example : LI3 (+ speed), LI4 (- speed)).

In both cases of operation, the maximum speed is given by the references applied to the analog inputs. For example, connect AI1 to +10V.

Configurable I/O Application Functions

Preset speeds
2, 4 or 8 speeds can be preset, requiring 1, 2, or 3 logic inputs respectively.

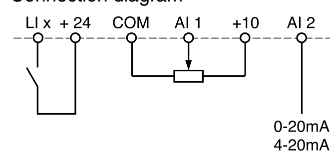
The following order of assignments must be observed : PS2 (LIx), then PS4 (LIy), then PS8 (LIz).

2 preset speeds		4 preset speeds			8 preset speeds			
Assign : LIx to PS2		Assign : LIx to PS2 then, LIy to PS4			Assignr : LIx to PS2 LIy to PS4, then LIz to PS8			
LIx	speed reference	LIy	LIx	speed reference	LIz	LIy	LIx	speed reference
0	LSP+reference	0	0	LSP+reference	0	0	0	LSP+reference
1	HSP	0	1	SP2	0	0	1	SP2
		1	0	SP3	0	1	0	SP3
		1	1	HSP	0	1	1	SP4
					1	0	0	SP5
					1	0	1	SP6
					1	1	0	SP7
					1	1	1	HSP

To unassign the logic inputs, the following order must be observed : PS8 (LIz), then PS4 (LIy), then PS2 (LIx).

Reference switching
Switching of two references (AI1 reference and AI2 reference) by logic input command.
This function automatically assigns AI2 to speed reference 2.

Connection diagram

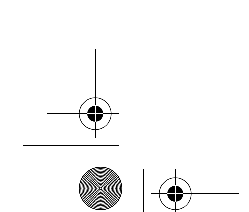
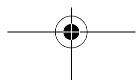
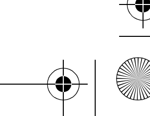
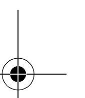


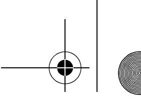
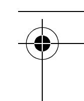
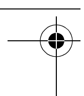
Open contact, reference = AI2
Closed contact, reference = AI1

Freewheel stop
Causes the motor to stop using the resistive torque only. The motor power supply is cut.
A freewheel stop is obtained when the logic input opens (state 0).

DC injection stop
An injection stop is obtained when the logic input closes (state 1).

Fast stop
Braked stop with the deceleration ramp time reduced by a reduction factor dCF which appears in the drive menu.
A fast stop is obtained when the logic input opens (state 0).

Configurable I/O Application Functions

Motor switching
This function is used to switch between two motors with different power ratings using the same speed controller. An appropriate sequence must be installed on the speed controller output. Switching is carried out with the motor stopped and the speed controller locked. The following internal parameters are automatically switched by the logic command :

- nominal motor current
- brake release current
- injection current

This function automatically inhibits thermal protection of the second motor.
Accessible parameter : Motor power ratio (PCC) in the drive menu.

Second torque limit
Reduction of the maximum motor torque when the logic input is active.
Parameter tL2 in the adjust menu.

Fault reset
Two types of reset are available : partial or general (rSt parameter in the "fault" menu).
Partial reset (rSt = RSP) :
Used to clear the stored fault and reset the speed controller if the cause of the fault has disappeared.
Faults affected by partial clearing :

- line overvoltage
- DC bus overvoltage
- motor phase loss
- overhauling
- communication fault
- motor overload
- loss of 4-20mA
- external fault
- motor overheating
- serial link fault
- speed controller overheating
- overspeed

General reset (rSt = RSG) :
This inhibits all faults (forced operation) except SCF (motor short-circuit) while the assigned logic input is closed.

Forced local mode
Used to switch between line control mode (serial link) and local mode (controlled via the terminals or via the display module).

Auto-tuning
When the assigned logic input changes to 1 an auto-tuning operation is triggered, in the same way as parameter tUn in the "drive" menu.

Caution : Auto-tuning is only performed if no command has been activated. If a "freewheel stop" or "fast stop" function is assigned to a logic input, this input must be set to 1 (active at 0).


Application : When switching motors, for example.

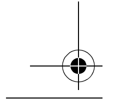
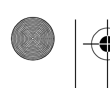
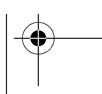
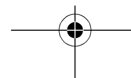
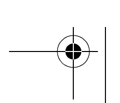
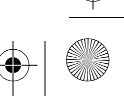
Auto-man PI, preset PI setpoints : PI operation

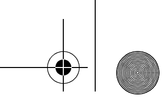
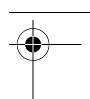
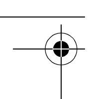
Torque limitation by AI
This function is only accessible if the analogue input AI3 is assigned to torque limit. If there is not a logic input configured on TL2 : second torque limit, the limit is directly given by AI3.
If a logic input is configured on TL2 second torque limit.

- When the input is 0 the limit is given by tLi
- When the input is 1 the limit is given by AI3

External fault
When the assigned logic input changes to 1, the motor stops (according to the configuration of the LSF Stop+flt parameter in the Drive menu), and the drive locks in EPF external fault fault mode.



Configurable I/O Application Functions

Analog input application functions

Input AI1 is always the speed reference.

Assignment of AI2 and AI3

Summing speed reference : The frequency setpoints given by AI2 and AI3 can be summed with AI1.

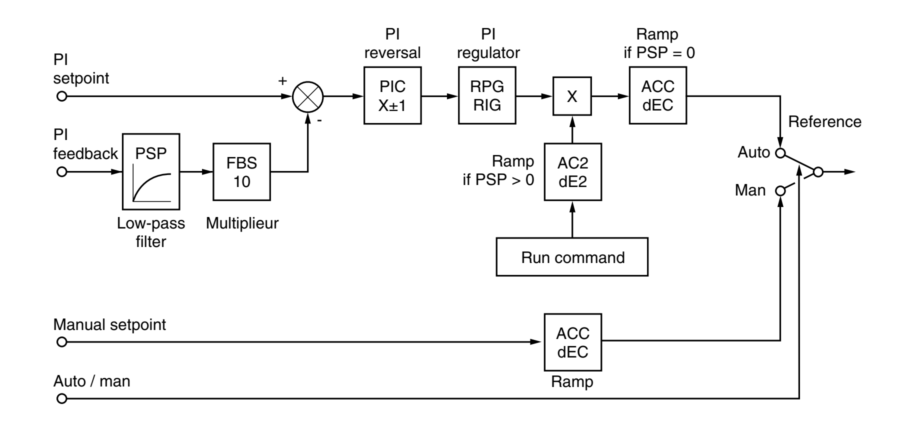
Speed regulation with tachogenerator : (Assignment on AI3 only with an I/O extension card with analog input)
An external divider bridge is required to adapt the voltage of the tachogenerator. The maximum voltage must be between 5 and 9þV. A precise setting is then obtained by setting the dtS parameter available in the adjust menu.

PTC probe processing : (only with an I/O extension card with analog input). Used for the direct thermal protection of the motor by connecting the PTC probes in the motor windings to analog input AI3.
PTC probe characteristics :
Total resistance of the probe circuit at 20þ°C = 750þW.

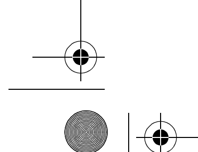
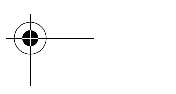
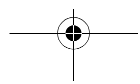
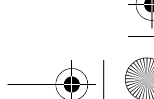
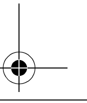
PI regulator: Used to regulate a process with a reference and a feedback given by a sensor. In PI mode the ramps are all linear, even if they are configured differently.
With the PI regulator, it is possible to:
- Adapt the feedback via FbS.
- Correct PI inversion.
- Adjust the proportional and integral gain (RPG and RIG).
- Assign an analog output for the PI reference, PI feedback and PI error.
- Apply a ramp to establish the action of the PI (AC2) on start-up if PSP > 0.
  If PSP = 0 the active ramps are ACC/dEC. The dEC ramp is always used when stopping.

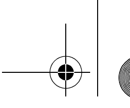
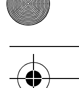
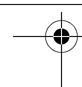
The motor speed is limited to between LSP and HSP.

Note: PI regulator mode is active if an AI input is assigned to PI feedback. This AI assignment can only be made after disabling any functions incompatible with PI.



Auto/Man: This function can only be accessed when the PI function is active, and requires an I/O extension card with analog input
Via logic input LI, this is used to switch operation to speed regulation if LIx = 0 (manual reference on AI3), and PI regulation if LIx = 1 (auto).

Configurable I/O Application Functions

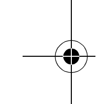
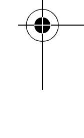
Analog input application functions

Preset setpoints:
2 or 4 preset setpoints require the use of 1 or 2 logic inputs respectively:

2 preset setpoints		4 preset setpoints		
Assign: LIx to Pr2		Assign: LIx to Pr2 then, LIy to Pr4		
LIx	Reference	LIy	LIx	Reference
0	Analog reference	0	0	Analog reference
1	Process max (= 10 V)	0	1	PI2 (adjustable)
		1	0	PI3 (adjustable)
		1	1	Process max (= 10 V)

Torque limit : (Only with an I/O extension card with analog input AI3)
The signal applied at AI3 operates in a linear fashion on the internal torque limit (parameter TLI in the "drive menu") :
- If AI3 = 0V : limit = TLI x 0 = 0
- If AI3 = 10 V : limit = TLI.

Applications : Torque or traction correction, etc.

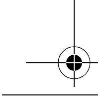
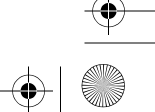
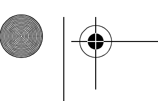
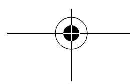
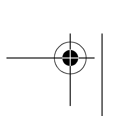
Encoder input application functions :

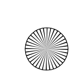
(Only with an I/O extension card with encoder input)

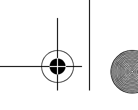
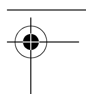
Speed regulation : Is used for speed correction using an incremental encoder or sensor.
(See documentation supplied with the card).

Summing speed reference : The setpoint from the encoder input is summed with AI1. (See documentation supplied with the card)

Applications :
- Synchronization of the speed of a number of speed controllers. Parameter PLS in the "drive" menu is used to adjust the speed ratio of one motor in relation to that of another.
- Setpoint via encoder.



Configurable I/O Application Functions

Logic output application functions

Relay R2, LO solid state output (with I/O extension card)

Downstream contactor control (OCC): can be assigned to R2 or LO
Enables the speed controller to control an output contactor (located between the speed controller and the motor). The request to close the contactor is made when a run command appears. The request to open the contactor is made when there is no more current in the motor.


If a DC injection braking function is configured, it should not be left operating too long in stop mode, as the contactor only opens at the end of braking.

Speed controller running (RUN) : can be assigned to R2 or LO
The logic output is at state 1 if the motor power supply is provided by the speed controller (current present), or if a run command is present with a zero reference.

Frequency threshold reached (FTA) : can be assigned to R2 or LO
The logic output is at state 1 if the motor frequency is greater than or equal to the frequency threshold set by Ftd in the adjust menu.

Setpoint reached (SRA): can be assigned to R2 or LO
The logic output is at state 1 if the motor frequency is equal to the setpoint value.

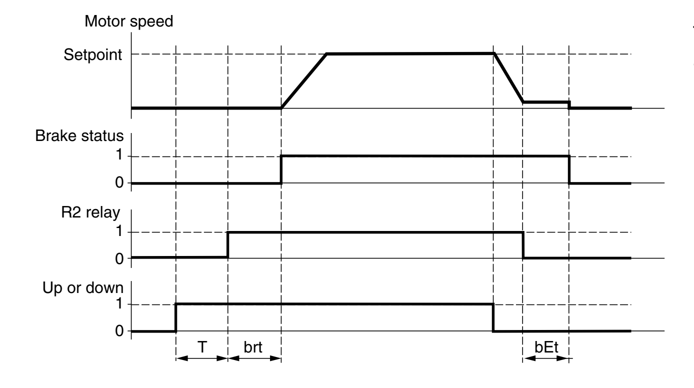
High speed reached (FLA): can be assigned to R2 or LO
The logic output is at state 1 if the motor frequency is equal to HSP.

Current threshold reached (CTA): can be assigned to R2 or LO
The logic output is at state 1 if the motor current is greater than or equal to the current threshold set by Ctd in the adjust menu.

Motor thermal state reached (TSA) : can be assigned to R2 or LO
The logic output is at state 1 if the motor thermal state is greater than or equal to the thermal state threshold set by ttd in the adjust menu.

Drive thermal state reached (TAD) : can be assigned to R2 or LO
The logic output is at state 1 if the drive thermal state is greater than or equal to the thermal state threshold set by dtd in the adjust menu.

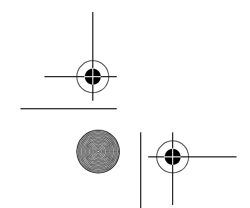
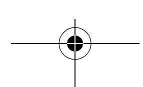
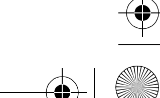
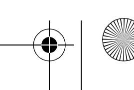
Brake sequence (BLC) : can only be assigned to relay R2
Used to control an electromagnetic brake by the speed controller, for vertical lifting applications. For brakes used for horizontal movement, use the “speed controller running“ function.

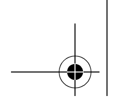
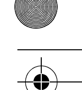
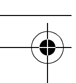


T = non-adjustable time delay

Settings which can be accessed in the adjust menu :
- brake release frequency (brL)
- brake release delay (brt)
- brake engage delay (bEt)
- brake release current (Ibn)
- brake engage frequency (bEn)



Configurable I/O Application Functions

Recommended settings for brake control, for a vertical lifting application :

1 Brake release frequency (brL) :

Set the brake release frequency to the value of the nominal slip multiplied by the nominal frequency in Hz (g x FS).

Calculation method : $slip = \frac{(Ns - Nr)}{Ns}$

Ns = synchronous speed in rpm.
(for 50 Hz supply : Ns = 3000 rpm for a motor with 1 pair of poles, 1500 rpm for a motor with 2 pairs of poles, 1000 rpm for a motor with 3 pairs of poles and 750 rpm for a motor with 4 pairs of poles,
for 60 Hz supply : Ns = 3600 rpm for a motor with 1 pair of poles, 1800 rpm for a motor with 2 pairs of poles, 1200 rpm for a motor with 3 pairs of poles and 900 rpm for a motor with 4 pairs of poles).
- Nr = nominal speed at nominal torque in rpm, use the speed indicated on the motor rating plate.
Release frequency = g x Fs.
- g = slip calculated previously
- Fs = nominal motor frequency (indicated on the motor rating plate)
Example : for a motor with 2 pairs of poles, 1430 rpm given on plate, 50 Hz supply.
g = (1500 - 1430) / 1500 = 0.0466
Brake release frequency = 0.0466 x 50 = 2.4 Hz

2 Brake release current (Ibr) :
Adjust the brake release current to the nominal current indicated on the motor.
Note regarding points 1 and 2 : the values indicated (release current and release frequency) correspond to theoretical values. If during testing, the torque is insufficient using these theoretical values, retain the brake release current at the nominal motor current and lower the brake release frequency (up to 2/3 of the nominal slip). If the result is still not satisfactory, return to the theoretical values then increase the brake release current (the maximum value is imposed by the speed controller) and increase the brake release frequency gradually.

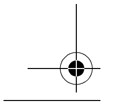
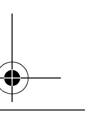
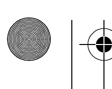
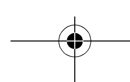
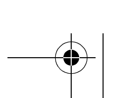
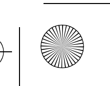
3 Acceleration time :
For lifting applications, it is advisable to set the acceleration ramps to more than 0.5 seconds. Ensure that the speed controller does not exceed the current limit.
The same recommendation applies for deceleration.
Note : for a lifting movement, a braking resistor should be used. Ensure that the settings and configurations selected cannot cause a drop or a loss of control of the lifted load.

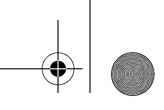
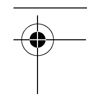
4 Brake release delay (brt) :
Adjust according to the type of brake. It is the time required for the mechanical brake to open.

5 Brake engage frequency (bEn) :
Set to twice the nominal slip (in our example 2 x 2.4 = 4.8 Hz). Then adjust according to the result.

6 Brake engage delay (bEt) :
Adjust according to the type of brake. It is the time required for the mechanical brake to close.

Loss of 4-20 mA signal (APL), can be assigned to R2 or L0
The logic output is set to 1 if the signal on the 4-20 mA input is less than 2 mA.


AO and AO1 analog output application functions

The analogue outputs AO and AO1 are the output currents of AOL (mA) and AOH (mA),
- AOL and AOH being configurable from 0 to 20 mA.

Examples AOL - AOH : 0 - 20 mA
4 - 20 mA
20 - 4 mA

Motor current (Code OCR) : the image of the motor rms current.
- AOH corresponds to twice the nominal speed controller current.
- AOL corresponds to zero current.

Motor frequency (Code OFR) : the motor frequency estimated by the speed controller.
- AOH corresponds to the maximum frequency (parameter tFr).
- AOL corresponds to zero frequency.

Ramp output (Code ORP) : the image of the ramp output frequency.
- AOH corresponds to the maximum frequency (parameter tFr).
- AOL corresponds to zero frequency.

Motor torque (Code TRQ) : the image of the motor torque as an absolute value.
- AOH corresponds to twice the nominal motor torque.
- AOL corresponds to zero torque.

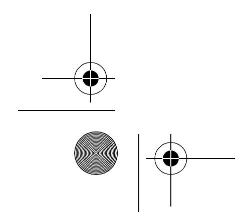
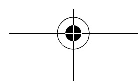
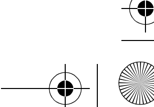
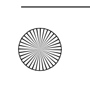
Signed motor torque (Code STQ) : the image of the motor torque and direction :
- AOL corresponds to a braking torque = twice the nominal torque
- AOH corresponds to a motor torque = twice the nominal torque.
- $\frac{AOH + AOL}{2}$ corresponds to zero torque.

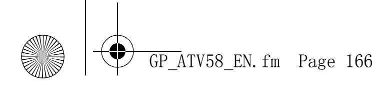
Signed ramp (Code ORS): the image of the ramp output frequency and direction.
- AOL corresponds to the maximum frequency (parameter tFr) in the reverse direction.
- AOH corresponds to the maximum frequency (parameter tFr) in the forward direction.
- $\frac{AOH + AOL}{2}$ corresponds to zero frequency.

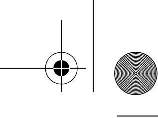
PI setpoint (Code OPS): the image of the PI regulator setpoint
- AOL corresponds to the minimum setpoint.
- AOH corresponds to the maximum setpoint.

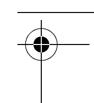
PI feedback (Code OPF): the image of the PI regulator feedback
- AOL corresponds to the minimum feedback.
- AOH corresponds to the maximum feedback.

PI error (Code OPE) : the image of the PI regulator error as a % of the sensor range (maximum feedback – minimum feedback)
- AOL corresponds to the maximum error < 0
- AOH corresponds to the maximum error >0
- $\frac{AOH + AOL}{2}$ corresponds to null error (OPE = 0)







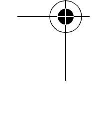
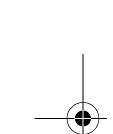
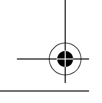

Configurable I/O Application Functions

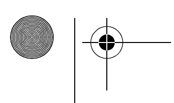
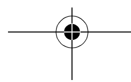
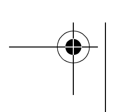
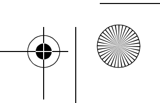
PI intégral (Code OPI) : the image of the PI regulator error integral.
- AOL corresponds to a null integral
- AOH corresponds to a saturated integral

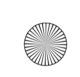
Motor power (Code OPR) : the image of the power drawn by the motor.
- AOL corresponds to 0 % of the motor nominal power.
- AOH corresponds to 200 % of the motor nominal power.

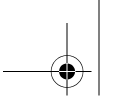
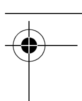
Motor thermal state (Code THD) : the image of the calculated motor thermal power.
- AOL corresponds to 0 %.
- AOH corresponds to 200 %.

Drive thermal state (Code THD) : the image of the drive thermal power.
- AOL corresponds to 0 %.
- AOH corresponds to 200 %.

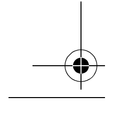
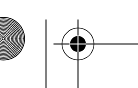
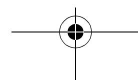
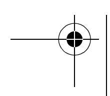
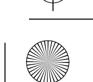


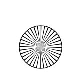
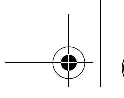
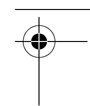



Fault Menu

This menu can be accessed when the switch is in position .
Modifications can only be made in stop mode with the speed controller locked.

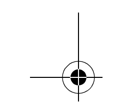
Code	Description	Factory setting
AtR	Auto Restart	No
	This function is used to restart the speed controller automatically if a fault has disappeared (Yes/No option). Automatic restarting is possible after the following faults : - line overvoltage - DC bus overvoltage - external fault - motor phase loss - serial link fault - communication fault - loss of 4-20 mA reference - motor overload (condition : motor thermal state less than 100 %) speed controller overheating (condition : speed controller thermal state less than 70 %) - motor overheating (condition : resistance of probes less than 1,500 Ohms) When the function is activated, following appearance of one or more of these faults, the R1 relay stays closed: the drive attempts to start every 30 s. A maximum of 6 attempts are made with the drive unable to start (fault present). If all 6 fail, the drive remains locked definitively with the fault relay open, until it is reset by being switched off. ⚠ This function requires the associated sequence to be maintained. **Ensure that accidental restarting will not pose any danger to either equipment or personnel.**	
rSt	Reset Type	RSP
	This function can be accessed if the fault reset is assigned to a logic input. 2 possible options : partial reset (RSP), general reset (RSG) Faults affected by a partial reset (rSt = RSP) - line overvoltage - motor overheating - motor overload - motor phase loss - serial link fault - communication fault - DC bus overvoltage - loss of 4-20mA - overhauling - speed controller overheating - external fault - overspeed Faults affected by a general reset (rSt = RSG) : all faults. The general reset actually inhibits all the faults (forced operation). To configure rSt = RSG : 1 Display RSG. 2 Press the "ENT" key. 3 The speed controller displays "See manual". 4 Press ▲ then ▼ then "ENT".	
OPL	OutPhaseLoss	Yes
	Used to enable the motor phase loss fault. (Fault is disabled if an isolator is used between the speed controller and the motor). Yes / No options	
IPL	InPhseLoss	Yes
	Used to enable the line phase loss fault. (Fault is disabled if there is a direct power supply via a DC bus, or a single phase supply to an ATV58•U72M2, U90M2, D12M2 Yes / No options This fault does not exist on the ATV58•U09M2, U18M2, U29M2 and U41M2.	

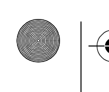
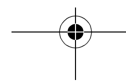
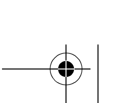
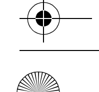






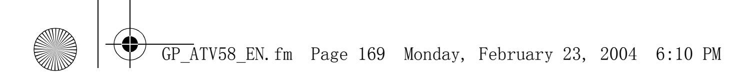




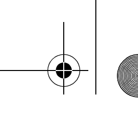
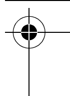

Fault Menu

Code	Description	Factory setting
tHt	ThermProType	ACL
	Defines the type of indirect motor thermal protection provided by the speed controller. If the PTC probes are connected to the speed controller, this function is not available. No thermal protection : NO: No Prot. Self-cooled motor (ACL) : the speed controller takes account of a derating depending on the rotation frequency. Force-cooled motor (FCL) : the speed controller does not take account of a derating depending on the rotation frequency.	
LFL	LossFollower	No
	Used to enable the loss of 4-20 mA reference fault. This fault can only be configured if the min/max AI2 ref. parameters (CrL and CrH) are greater than 3 mA, or if CrL>CrH, - No : no fault. - Yes : immediate fault. - STT : stop according to the parameter STT, without a fault restart on the return of the signal. - LSF : stop according to the parameter STT, drive shows a fault after stopping. - LFF : Force the speed to the value set by LFF. - RLS : maintain the speed reached when the 4-20mA disappeared without a fault, restart on the return of the signal.	
LFF	Flt. Speed 4-20	0
	Fallback speed in the event of the loss of the 4-20mA signal. Can be adjusted from 0 to HSP.	
FLr	Catch On Fly	No
	Used to enable a smooth restart after one of the following events : - loss of line supply or simple power off - fault reset or automatic restart. - freewheel stop or injection stop with logic input - uncontrolled loss downstream of the speed controller Yes / No options. If relay R2 is assigned to the brake sequence function, the FLr parameter remains locked on No.	
StP	Cont. Stop	No
	Controlled stop on a line phase loss. This function is only operational if parameter IPL is set to No. If IPL is set to Yes, leave StP in position No. Possible choices : **No** : locking on loss of line supply MMS : Maintain DC Bus : voltage for the speed controller control is maintained by the kinetic energy restored by the inertia, until the **USF** fault (undervoltage) occurs **FRP** : Follow ramp : deceleration following the programmed dEC or dE2 ramp until a stop or until the USF fault (undervoltage) occurs. This operation does not exist on ATV58•U09M2, U18M2, U29M2 and U41M2.	
Sdd	RampNotFoll	Yes
	This function can be accessed if feedback via tachogenerator or pulse generator is programmed. When enabled, it is used to lock the speed controller, if a speed error is detected (difference between the stator frequency and the measured speed). Yes / No options.	
EPL	External fault	Yes
	Defines the type of stop on externel fault: - Yes: immediate fault - LSF Stop+flt: stop according to the Stt parameter, then fault at the end of stopping	






Files Menu

This menu can be accessed when the switch is in position 🔓.
The operations are only possible in stop mode with the speed controller locked.

The display module is used to store 4 files containing the speed controller configurations.

Code	Description	Factory setting
F1S F2S F3S F4S	File 1 State File 2 State File 3 State File 4 State	FRE FRE FRE FRE
	Used to display the state of the corresponding file. Possible states : **FRE** : file free (state when display module is delivered) **EnG** : A configuration has already been saved in this file	
FOt	Operat.Type	NO
	Used to select the operation to be performed on the files. Possible operations : **NO** : no operation requested (default value on each new connection of the display module to the speed controller) **STR** : operation to save the speed controller configuration in a file on the display module **REC** : transfer of the content of a file to the speed controller **Ini** : return of the speed controller to factory settings ⚠ **A return to the factory settings cancels all your settings and your configuration.**	

Operating mode

Select STR, REC or InI and press "ENT".

1 If Operation = STR :
The file numbers are displayed. Select a file using ▲ or ▼ and confirm with "ENT".

2 If Operation = REC :
The file numbers are displayed. Select a file using ▲ or ▼ and confirm with "ENT".

- The display indicates : CH WIRING OK? ENT

  Check that the wiring is compatible with the file configuration.
  Cancel with "ESC" or confirm with "ENT"
- The display then requests a second confirmation using "ENT" or cancelation using "ESC".

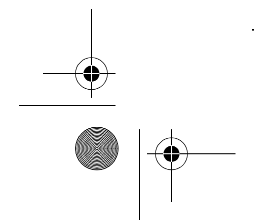
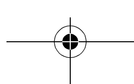
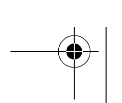
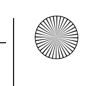
3 If Operation = InI :
Confirm with "ENT"

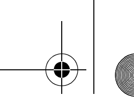
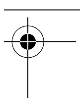
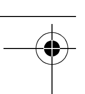
- The display indicates : CH WIRING OK? ENT

  Check that the wiring is compatible with the factory configuration.
  Cancel with "ESC" or confirm with "ENT".
- The display then requests a second confirmation using "ENT" or cancelation using "ESC".

At the end of each operation the display returns to the "Operation" parameter, set to "NO"



Files Menu

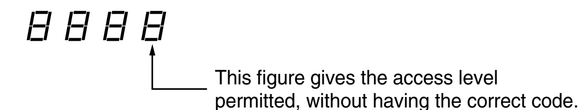
Files menu (continued)

Code	Description
COd	Password
	Confidential code

The speed controller configuration can be protected by a password (COd).

CAUTION : THIS PARAMETER SHOULD BE USED WITH CAUTION. IT MAY PREVENT ACCESS TO ALL PARAMETERS. ANY MODIFICATION TO THE VALUE OF THIS PARAMETER MUST BE CAREFULLY NOTED AND SAVED.

The code value is given by four figures, the last of which is used to define the level of accessibility required by the user.



Access to the menus according to the position of the access locking switch on the rear of the display module is always operational, within the limits authorized by the code.
The value Code 0000 (factory setting) does not restrict access.

The table below defines access to the menus according to the last figure in the code.

	Last figure in the code		
Menus	Access locked	Display	Modification
Adjust	0 exc. 0000 and 9	1	2
Level 2 : Adjust, Macro-config, Drive, Control, I/O, Fault, File (excluding code), Communication (if card present)	0 exc. 0000 and 9	3	4
Application (if card present)	0 exc. 0000 and 9	5	6
Level 2 and Application (if card present)	0 exc. 0000 and 9	7	8

For access to the APPLICATION menu, refer to the application card documentation.

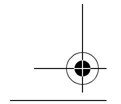
The code is modified using the ▲ and ▼ keys.

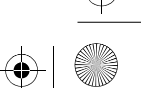
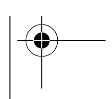
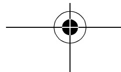
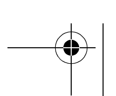
If an incorrect code is entered, it is refused and the following message is displayed :

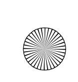
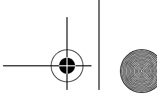


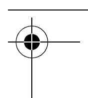
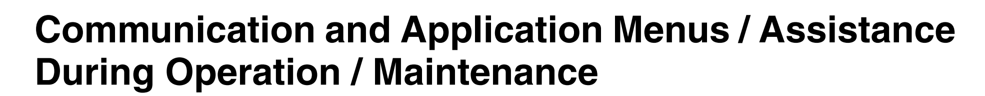
After pressing the ENT or ESC key on the keypad, the value displayed for the Code parameter changes to 0000 : the level of accessibility does not change. The operation should be repeated.

To access menus protected by the access code the user must first enter this code which can always be accessed in the Files menu.



Communication and Application Menus / Assistance During Operation / Maintenance

Communication menu

This menu is only displayed if a communication card is installed. It can be accessed when the switch is in position . Configuration is only possible in stop mode with the speed controller locked.

For use with a communication option card, refer to the document provided with this card.

For communication via the RS485 link on the basic product, refer to the document provided with the RS485 connection kit.

Application menu

This menu is only displayed if a “client application“ card is installed. It can be accessed when the switch is in position . Configuration is only possible in stop mode with the speed controller locked. **Refer to the document provided with the card.**

Assistance during operation

See the indicator lamps explained in the “Introduction”.

Maintenance



Before working on the speed controller, switch off the power supply and wait for the capacitors to discharge (approximately 3 minutes) : the green LED on the front panel of the speed controller is no longer illuminated.

CAUTION : the DC voltage at the + and - terminals or PA and PB terminals may reach 900þV depending on the line voltage.

If a problem arises during setup or operation, ensure that the recommendations relating to the environment, mounting and connections have been observed. **Refer to the Altivar User's Manual.**

Servicing

The Altivar 58 does not require any preventive maintenance. It is nevertheless advisable to perform the following regularly :

- check the condition and tightness of connections
- ensure that the temperature around the unit remains at an acceptable level, and that ventilation is effective (average service life of fans : 3 to 5 years depending on the operating conditions)
- remove any dust from the speed controller

Assistance with maintenance

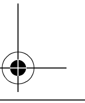
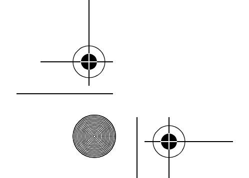
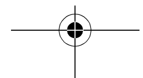
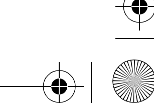
The first fault detected is stored and displayed on the display module screen : the speed controller locks, the red LED lights, and fault relay R1 trips.

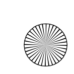
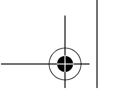
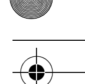
Clearing the fault

Cut the power supply to the speed controller in the event of a non-resettable fault.
Locate the cause of the fault in order to eliminate it.
Reconnect the power supply : this clears the fault if it has disappeared.

In some cases, there may be an automatic restart once the fault has disappeared, if this function has been programmed.

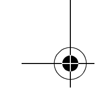
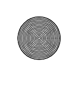
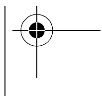
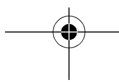
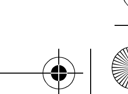
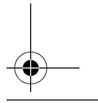
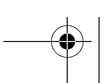


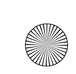
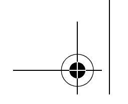
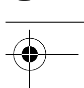






Maintenance

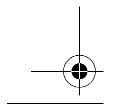
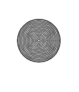
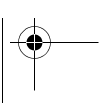
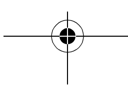
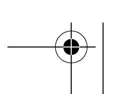
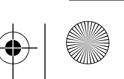
Fault displayed	Probable cause	Procedure, remedy
PHF Mains Phase Loss	• speed controller incorrectly supplied or fuses blown • transient fault on one phase • use on a single phase supply of an ATV58•U72M2, U90M2 or a D12M2 (3-phase)	• check the power connection and the fuses • reset • configure the "In Phase Loss" (code IPL) fault to "No", in the FAULT menu
USF Undervoltage	• line supply too low • transient voltage dip • damaged load resistor	• check the line voltage • change the load resistor
OSF Overvoltage	• line supply too high	• check the line voltage
OHF Drive Overheat	• heatsink temperature too high (tHd>118 %)	• monitor the motor load, the speed controller ventilation and wait for it to cool down before resetting
OLF Mot Overload	• thermal trip due to prolonged overload (tHr>118 %)	• check the thermal protection setting, monitor the motor load • a reset will be possible after approximately 7 minutes
ObF Overbraking	• braking too sudden or driving load • supply overvoltage during operation	• increase the deceleration time, add a braking resistor if necessary • check the possible supply overvoltage
OPF Motor Phase Loss	• one phase cut at the speed controller output	• Check the motor connections and the operation of the output contactor (if fitted) • If a motor starter is used in macro configuration, check the configuration of the relay R2 and the output contactor
LFF Loss Follower	• loss of the 4-20mA setpoint on input AI2	• check the connection of the setpoint circuits
OCF Overcurrent	• ramp too short • inertia or load too high • mechanical locking	• check the settings • check the size of the motor/speed controller/load • check the state of the mechanism
SCF Short Circuit	• short-circuit or grounding at the speed controller output	• check the connection cables with the speed controller disconnected, and the motor insulation. Check the speed controller transistor bridge
CrF Precharge Fault	• load relay control fault • damaged load resistor	• check the connectors in the speed controller and the load resistor
SLF Serial Link Flt	• incorrect connection on the speed controller terminal port	• check the connection on the speed controller terminal port
OtF Motor Overheat	• motor temperature too high (PTC probes)	• check the motor ventilation and the ambient temperature, monitor the motor load • check the type of probes used
tSF PTC Therm Sensor	• incorrect connection of probes to the speed controller	• check the connection of the probes to the speed controller • check the probes

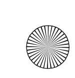
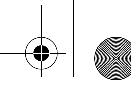








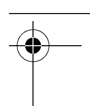





Maintenance

Fault displayed	Probable cause	Procedure, remedy
EEF EEprom Fault	• error saving in EEPROM	• cut the power supply to the speed controller and reset
InF Internal Fault	• internal fault • connector fault	• check the connectors in the speed controller
EPF External Fault	• fault triggered by an external device	• check the device which has caused the fault and reset
SPF Sp. Feedbk. Loss	• no speed feedback	• check the connection and the mechanical coupling of the speed sensor
AnF Load Veer. Flt	• non-following of ramp speed inverse to the setpoint	• check the speed feedback setting and wiring • check the suitability of the settings for the load • check the size of the motor - speed controller and the possible need for a braking resistor
SOF Overspeed	• instability driving load too high	• check the settings and the parameters add a braking resistor • check the size of the motor/speed controller/load
CnF Network Fault	• communication fault on the fieldbus	• check the network connection to the speed controller • check the time-out
ILF Int. Comm. Flt	• communication fault between the option card and the control card	• check the connection of the option card to the control card
CFF Rating Fault-ENT Option Fault-ENT Opt. Missing-ENT CKS Fault - ENT	Error probably caused when changing the card : • change of rating of the power card • change of the type of option card or installation of an option card if there was not one already and if the macro-configuration is CUS • option card removed • inconsistent configuration saved The following message appears when ENT is pressed : Fact.Set? ENT/ESC	• check the hardware configuration of the speed controller (power card, others) • cut the power supply to the speed controller then reset • save the configuration in a file on the display module • press ENT to return to the factory settings
CFI Config. Fault	• inconsistent configuration sent to speed controller via serial link	• check the configuration sent previously • send a consistent configuration

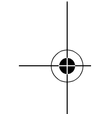
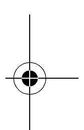
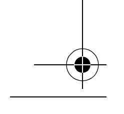



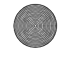
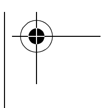
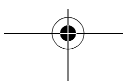
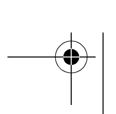
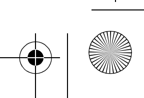



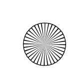
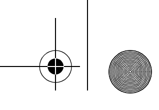
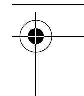
Maintenance

Malfunction with no fault display

Display	Probable cause	Procedure, remedy
No code, LEDs not illuminated	• No power supply	• Check power supply to speed controller
No code, green LED illuminated, red LED illuminated or not illuminated	• Display module defective	• Change the display module
rdY green LED illuminated	• Speed controller in line mode with communication card or RS485 kit • An LI input is assigned to “Freewheel stop” or “Fast stop”, and this input is not switched on. These stops are controlled by loss of the input.	• Set parameter LI4 to forced local mode then use LI4 to confirm this forced mode. • Connect the input to 24 V to disable the stop.

Saving the Configuration and Settings

Speed controller reference ATV58 .... Display rEF : ....
Client identification number (if applicable) :
Option card : No ☐ Yes ☐ : reference ....

Access code : No ☐ Yes ☐ : ....
Configuration in file no. .... on the display module
Macro-configuration : ....

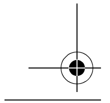
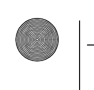
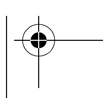
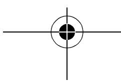
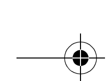
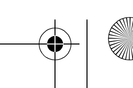
For CUS : Customize configuration, assign the I/O as follows :

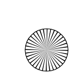
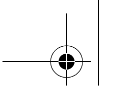
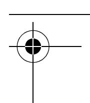
	ALTIVAR	Option card
Logic inputs	LI 1 : LI 2 : LI 3 : LI 4 :	LI 5 : LI 6 :
Analog inputs	AI 1 : AI 2 :	AI 3 :
Encoder input		AI3 :
Relay	R2 :	
Logic output		LO :
Analog output	AO1 :	AO :

Adjustment parameters :

Code	Factory setting	Client setting (1)	Code	Factory setting	Client setting (1)
ACC	3 s	s	SP7	35 Hz	Hz
dEC	3 s	s	JOG	10 Hz	Hz
LSP	0 Hz	Hz	JGt	0,5 s	s
HSP	50 / 60 Hz	Hz	brL	0 Hz	Hz
FLG	20 %	%	Ibr	0 A	A
StA	20 %	%	brt	0 s	s
ItH	acc. to model	A	bEn	0 Hz	Hz
IdC	acc. to model	A	bEt	0 s	s
tdC	0.5 s	s	FFt	50/60 Hz	Hz
SdC	0.5 ItH	A	bIP	no	
AC2	5 s	s	rPG	1	
dE2	5 s	s	rIG	1 / s	/ s
JPF	0 Hz	Hz	FbS	1	
JF2	0 Hz	Hz	PIC	no	
JF3	0 Hz	Hz	dtS	1	
tLS	0	s	Ctd	1.36 In	A
USC	1		ttd	100 %	%
UFr	100 %	%	tL2	200%	%
SLP	100 %	%	PSP	0 s	s
PFL	20 %	%	PI2	30 %	%
SP2	10 Hz	Hz	PI3	60 %	%
SP3	15 Hz	Hz	dtd	105 %	%
SP4	20 Hz	Hz	Ftd	50/60 Hz	Hz
SP5	25 Hz	Hz	F2d	50/60 Hz	Hz
SP6	30 Hz	Hz			

(1) leave blank when the parameter is missing


Saving the Configuration and Settings

Drive menu parameters :

Code	Factory setting	Client setting (1)	Code	Factory setting	Client setting (1)
UnS	acc. to model	V	rPt	LIN	Hz
FrS	50 / 60 Hz	Hz	dCF	4	
nCr	acc. to model	A	tLI	200%	%
nSP	acc. to model	rpm	CLI	1.36 In	A
COS	acc. to model		AdC	yes	
tUn	no		PCC	1	
tFr	60 / 72 Hz	Hz	SFt	LF	
nLd	no		SFr	acc. to model	kHz
Fdb	no		nrd	yes	
brA	no		SPC	no	
Frt	0 Hz		PGt	DET	
Stt	STN		PLS	1024	

(1) leave blank when the parameter is missing

Control menu parameters :

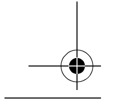
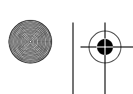
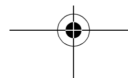
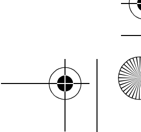
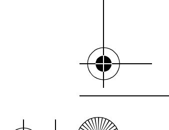
Code	Factory setting	Client setting (1)	Code	Factory setting	Client setting (1)
tCC	2 W		AOH	20 mA	mA
tCt	LEL		Str	no	
rIn	no		LCC	no	
bSP	no		PSt	yes	
CrL	4 mA	mA	Add	0	
CrH	20 mA	mA	tbr	19200	
AOL	0 mA	mA	rPr	no	

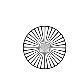
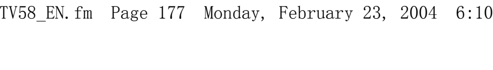
(1) leave blank when the parameter is missing

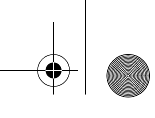
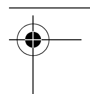
Fault menu parameters :

Code	Factory setting	Client setting (1)	Code	Factory setting	Client setting (1)
Atr	no		LFF	0 Hz	Hz
rSt	RSP		FLr	no	
OPL	yes		StP	no	
IPL	yes		Sdd	yes	
tHt	ACL		EPL	yes	
LFL	no				

(1) leave blank when the parameter is missing

Summary of Menus

LANGUAGE menu

Label	Code
English	LnG
Français	LnG
Deutsch	LnG
Español	LnG
Italiano	LnG

MACRO-CONFIG menu

Label	Code
Hdg : Handling	CFG
GEn : General Use	CFG
VT : Var. Torque	CFG

1 - DISPLAY menu

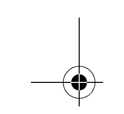
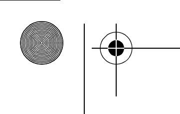
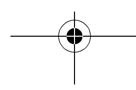
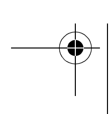
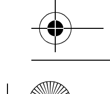
Label	Code
Var. State	---
Freq. Ref.	FrH
Output Freq.	rFr
Motor Speed	SPd
MotorCurrent	LCr
Machine Spd.	USP
Output Power	OPr
MainsVoltage	ULn
MotorThermal	tHr
DriveThermal	tHd
Last Fault	LFt
Freq. Ref.	LFr
Consumption	APH
Run time	rtH

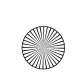
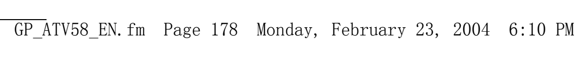
2 - ADJUST menu

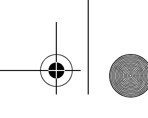
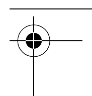
Label	Code
Freq. Ref. - Hz	LFr
Acceleration - s	ACC
Deceleration - s	dEC
Accelerate 2 - s	AC2
Decelerate 2 - s	dE2
Low Speed - Hz	LSP
High Speed - Hz	HSP
Gain - %	FLG
Stability - %	StA

2 - ADJUST menu (continued)

Label	Code
ThermCurrent - A	ItH
DC Inj.Curr. - A	IdC
DC Inj. Time - s	tdC
DC Stop Curr.- A	SdC
Jump Freq. - Hz	JPF
Jump Freq.2 - Hz	JF2
Jump Freq.3 - Hz	JF3
Machine Coef.	USC
LSP Time - s	tLS
IR Compens. - %	UFr
Slip Comp. - %	SLP
Preset Sp.2 - Hz	SP2
Preset Sp.3 - Hz	SP3
Preset Sp.4 - Hz	SP4
Preset Sp.5 - Hz	SP5
Preset Sp.6 - Hz	SP6
Preset Sp.7 - Hz	SP7
Curr.Lev.Att - A	Ctd
Jog Freq. - Hz	JOG
JOG Delay - s	JGt
Trq.Limit 2 - %	tL2
V/f Profile - %	PFL
PI Prop. Gain	rPG
PI Int. Gain - /s	rIG
PI Coeff.	FbS
PI Inversion	PIC
BrReleaseLev - Hz	brL
BrRelease I - A	Ibr
BrReleasTime - s	brt
BrEngage Lev - Hz	bEn
BrEngageTime - s	bEt
Trip Thresh NST-Hz	FFt
Brake impul.	bIP
Tacho Coeff.	dtS
Freq.Lev.Att - Hz	Ftd
Freq.Lev.2 - Hz	F2d
ThermLev.Att - %	ttd
PI Filter - s	PSP
PI Preset 2 - %	PI2
PI Preset 3 - %	PI3
ATV Th. fault	dtd

3 - DRIVE menu

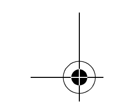
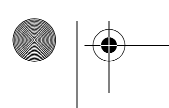
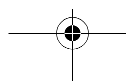
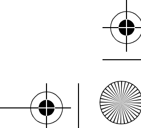
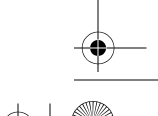
Label	Code
Nom.Mot.Volt - V	UnS
Nom.Mot.Freq - Hz	FrS
Nom.Mot.Curr - A	nCr
Nom.MotSpeed -rpm	nSP
Mot. Cos Phi	COS
Auto Tuning	tUn
Max. Freq. - Hz	tFr
Energy Eco	nLd
I lim Adapt.	Fdb
DecRampAdapt	brA
SwitchRamp2 - Hz	Frt
Type of stop	Stt
Ramp Type	rPt
DECRampCoeff	dCF
Trq.Limit - %	tLI
Int. I Lim - A	CLI
Auto DC Inj.	AdC
Motor P Coef	PCC
Sw Freq. Type	SFt
Sw Freq -kHz	SFr
Noise Reduct	nrd
Sp'l Motor	SPC
PG Type	PGt
Num. Pulses	PLS

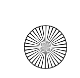
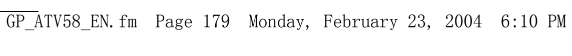
4 - CONTROL menu

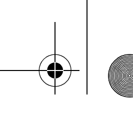
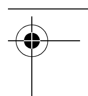
Label	Code
TermStripCon	tCC
Type 2 Wire	tCt
RV Inhibit.	rIn
deadb./pedst	bSP
AI2 min Ref. - mA	CrL
AI2 Max Ref - mA	CrH
Min Val. AO - mA	AOL
Max Val. AO - mA	AOH
Save Ref.	Str
Keypad Comm.	LCC
Stop Priorit	PSt
DriveAddress	Add
BdRate RS485	tbr
Reset counters	rPr

5 - I/O menu

Label	Code
LI2 Assign.	LI2
LI3 Assign.	LI3
LI4 Assign.	LI4
LI5 Assign.	LI5
LI6 Assign.	LI6
NO :Not assigned	
RV :Reverse	
RP2:Switch ramp2	
JOG:JOG	
+SP: + Speed	
-SP: - Speed	
PS2: 2 preset SP	
PS4: 4 preset SP	
PS8: 8 preset SP	
RFC:Auto/manu	
NST:Freewhl Stop	
DCI:DC inject.	
FST:Fast stop	
CHP:Multi. Motor	
TL2:Trq.Limit 2	
FLO:Forced Local	
RST:Fault Reset	
ATN:Auto-tune	
PAU:PI Auto/Manu	
PR2:PI 2 Preset	
PR4:PI 4 Preset	
TLA:Torque limit	
EDD:Ext flt.	
R2 Assign.	r2
LO Assign.	LO
NO:Not assigned	
RUN:DriveRunning	
OCC:OutputCont.	
FTA:Freq Attain.	
FLA:HSP Attained	
CTA:I Attained	
SRA:FRH Attained	
TSA:MtrTherm Lvl	
BLC:Brk Logic	
APL:4-20 mA loss	
F2A:F2 Attained	
TAD:Alarm.th.var.	

Summary of Menus

5 - I/O menu (continued)

Label	Code
AI2 Assign. AI3 Assign.	AI2 AI3
NO:Not assigned FR2:Speed Ref2 SAI:Summed Ref. PIF:PI regulator PIM:PI Man.ref. SFB:Tacho feedbk PTC:Therm.Sensor ATL:Torque limit	
AI3Assign(encoder)	AI3
NO:Not assigned SAI:Summed ref. RGI:PG feedbk	
AO Assign.	AO
NO:Not assigned OCR:Motor Curr. OFR:Motor Freq. ORP:Ramp Output TRQ:Motor torque STQ:Signed torque ORS:Signed ramp OPS:PI ref. OPF:PI Feedback OPE:PI Error OPI:PI Integral OPR:Motor power tHR:Motor Thermal tHD:Drive Thermal	

6 - FAULT menu

Label	Code
Auto Restart	Atr
Reset Type	rSt
OutPhaseLoss	OPL
InPhaseLoss	IPL
ThermProType	tHt
LossFollower	LFL
Flt. Speed 4-20	LFF
Catch On Fly	FLr
Cont. Stop	StP
RampNotFoll	Sdd
External fault	EPL

7 - FILES menu

Label	Code
File 1 State	F1S
File 2 State	F2S
File 3 State	F3S
File 4 State	F4S
Operat.Type	FOt
Conf. Code	COd

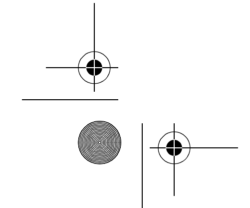
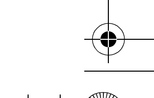


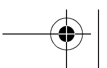
8 - COMMUNICATION menu

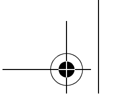
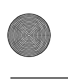
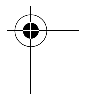
Refer to the documentation provided with the communication card.

8 - APPLICATION menu

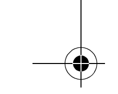
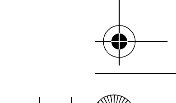
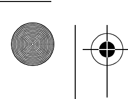
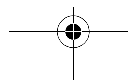
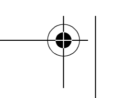
Refer to the documentation provided with the application card.




Index

施耐德电气公司
Schneider Electric China
www.schneider-electric.com.cn

北京市朝阳区东三环北路
8号亮马大厦17层
邮编: 100004
电话: (010) 6590 6907
传真: (010) 6590 0013

17/F, Landmark Building
8 North Dongsanhuan Road
Chaoyang District Beijing 100004
Tel: (010) 6590 6907
Fax: (010) 6590 0013

由于标准和材料的变更，文中所述特性和本资料中的图象只有经过我们的业务部门确认以后，才对我们有约束。


本手册采用生态纸印刷

SC DOC 187-VVD

2004.01